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# BLUE JAY

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June 1999





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# EDITOR'S MESSAGE

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It is with a tinge of sadness I start my last editorial and try to thank the many people who have contributed to my sojourn as editor. These include the Board and staff at Nature Saskatchewan, the Associate Editors, contributors and the many, many people who have helped in ways large and small. I will particularly miss the interchange I had with the contributors.

I will also miss the prairie. While I plan at least three trips for this year, it is not the same as living in the west. I remember the cascade of bluebirds we saw through an early spring snowfall. I took several wonderful trips with the irrepressible Frank Roy, I sat on the porch with Sig and Ruby Jordheim listening to his peacocks. I worked on conservation issues with Garth Nelson, benefiting from his eloquence and his strength of purpose. Stephanie and I both ducked instinctively (and unnecessarily – we were inside a car) when a mad rush of cranes passed just overhead, flushed by a Golden Eagle. I watched as a group of New Zealanders howled like wolves in the piercing frost of Prince Albert National Park, and wondered what the home faculty would think of a law professor wailing during the wee hours. I took part in a wonderful NS trip to Churchill, where it patted a mother Polar Bear's rear (after it was sedated!). I showed Margaret Atwood her life Whooping Cranes; nine birds that began to dance and show off as soon as we arrived. I have peered through the heat shimmer at thousands of Hudsonian Godwits at Luck Lake. One dawn, at Last Mountain lake I stood under thousands of geese and cranes as they dispersed into the rising sun. With a mixture of joy and sadness I watched Burrowing Owls feed their young. Two coyotes howled from to each other from opposite sides of the Gardiner Dam. Can I forget those awful drives we took through heaps of the sticky mud? The farmer who saw two frozen CBC counters and immediately invited us in for hot coffee. The trip, especially arranged for me, that I took to see mountain wildflowers. The vast blue sky with a Swainson's Hawk spiraling ever upward. The varied forms and subtle colours of the prairie landscapes I have enjoyed. A mother Black Bear with one cinnamon and one black cube who ripped apart a rotten log for grubs. These are some of the memories of people, places and wildlife that have made the prairies special to me. I will always remember that "It is better to have lived in the prairies for a few years than never to have lived there at all."

I want to end by saying what a wonderful help Stephanie has been in this process. She has typed, proofed, commented, edited and organized. To quote Stuart Houston she has been "a gem."

Sincerely,  
Roy D. John



## GREAT HORNED OWL NESTING ON A CLIFF AND GAS PLANT TOWER IN ALBERTA

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### Introduction

The Great Horned Owl (*Bubo virginianus*) has the most extensive range and the most variable nesting sites of any North American owl.<sup>4</sup> In Alberta, it is widely dispersed, nesting most commonly in parkland regions (46% of surveyed 10km<sup>2</sup> squares) and least commonly in the Rocky Mountains (13% of surveyed squares).<sup>9</sup>

Nest site selection may depend on environmental variations in site availability, relative prey distribution, and in some cases, relative freedom from human disturbance.<sup>5</sup> Throughout North America, the most commonly used nest sites are tree nests of other species, but

cavities in trees and snags, cliffs, deserted buildings, and artificial platforms are also used.<sup>4</sup> Known nest sites in Alberta include primarily abandoned hawk or crow nests and occasionally hollow trees that have been found in forests, woodlots, groves, coulees, and river valleys.<sup>7,9</sup> This paper documents possibly the first occurrence in Alberta of a Great Horned Owl nesting on a cliff ledge (M. Preston) and among a human-made structure (G. Booth).

### Cliff Site

Johnston Canyon, in Banff National Park, is relatively narrow and formed primarily of steep and jagged limestone that has been gradually eroded by



**Figure 1 - Two Great Horned owlets on a cliff ledge at Johnston Canyon, Banff National Park, 31 May 1998.** Michael Preston



Johnston Creek. The canyon seldom exceeds 15 m across, except in areas where the upper and lower falls pour into their respective basins. The surrounding habitat of the canyon is primarily coniferous, with white spruce (*Picea glauca*) dominating. The deeply shaded and often damp canyon also supports many mosses and low-growing plants. The characteristic mammals include Least Chipmunk (*Tamias minimus*), Red Squirrel (*Tamiasciurus hudsonicus*) and Columbian Ground Squirrel (*Spermophilus columbianus*), with the latter occurring mainly at the base of the canyon where tourists park their vehicles.

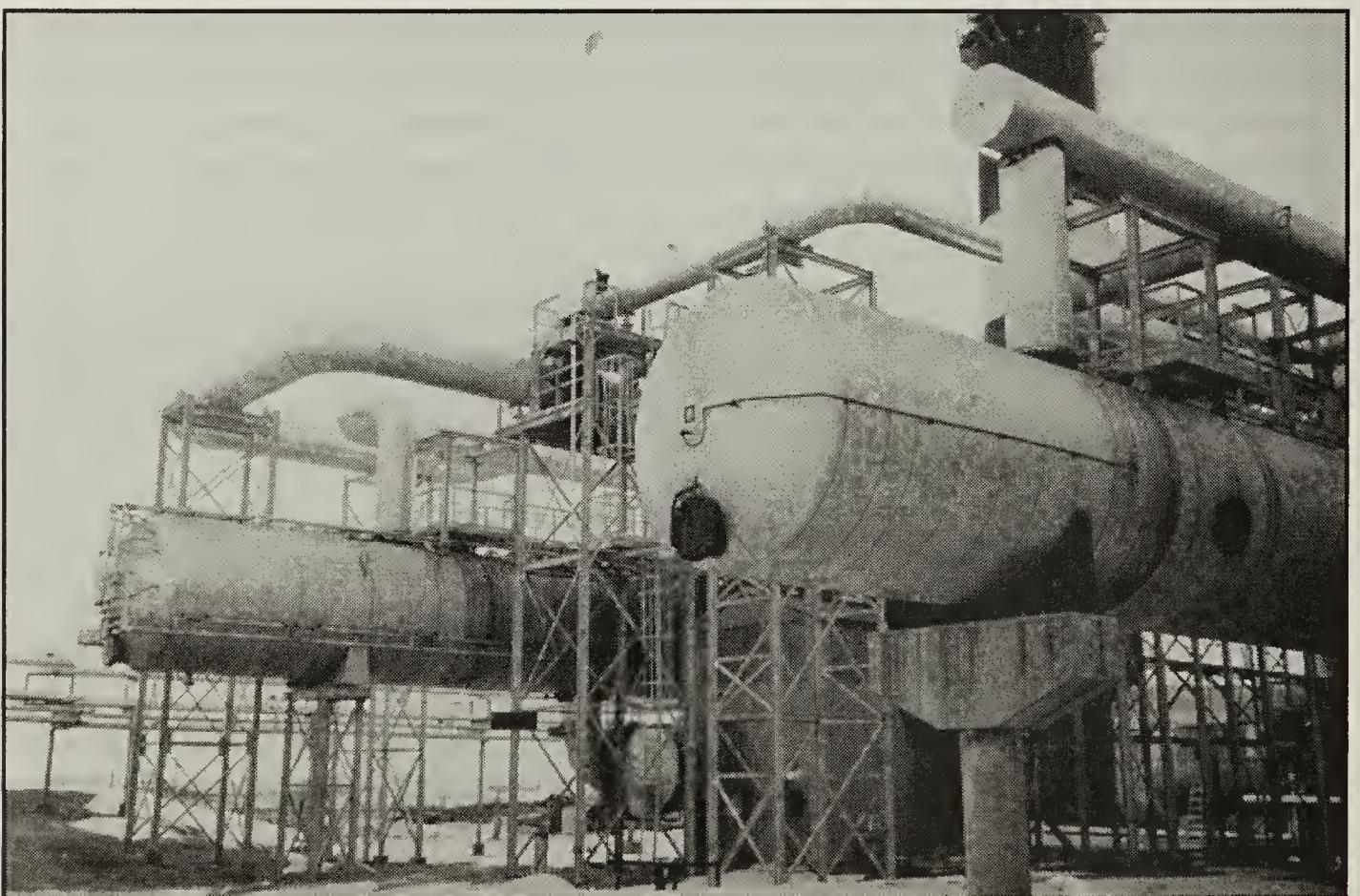
This nest was located about 500 m from the parking area, up Johnston Creek, and opposite the footpath. At about 10 m above the surface of the creek, a fairly shallow but wide crevice supported the nest. On 31 May 1998, two flightless young were observed on the lip of the ledge (Fig 1). Adult birds were not observed and no prey remains were found. The depth of the ledge could

not be determined, nor was it clear whether the nest was a simple scrape without nesting material from a previous occupant.

The use of cliff sites by Great Horned Owls is probably more common in Alberta than is known. However, access to such potential sites by humans is probably limited, as Great Horned Owls nest early in the season when many regions are snowed in. In the eastern Great Basin Desert, Utah, cliff faces and rock outcrops were favored sites,<sup>10</sup> while in the intermountain West, nest holes in cliffs were used for many years.<sup>4</sup> In British Columbia, 20% of natural sites were among cliffs,<sup>1</sup> further suggesting that this behavior is not all that uncommon.

### Gas Plant Site

During the breeding season of 1997, the Rockyview Wildlife Recovery Center learned of a grounded owlet at the Amoco Canada Petroleum



**Figure 2. - Great Horned Owl nest location at gas plant, Crossfield, Alberta**  
**Gordon Clayholt**



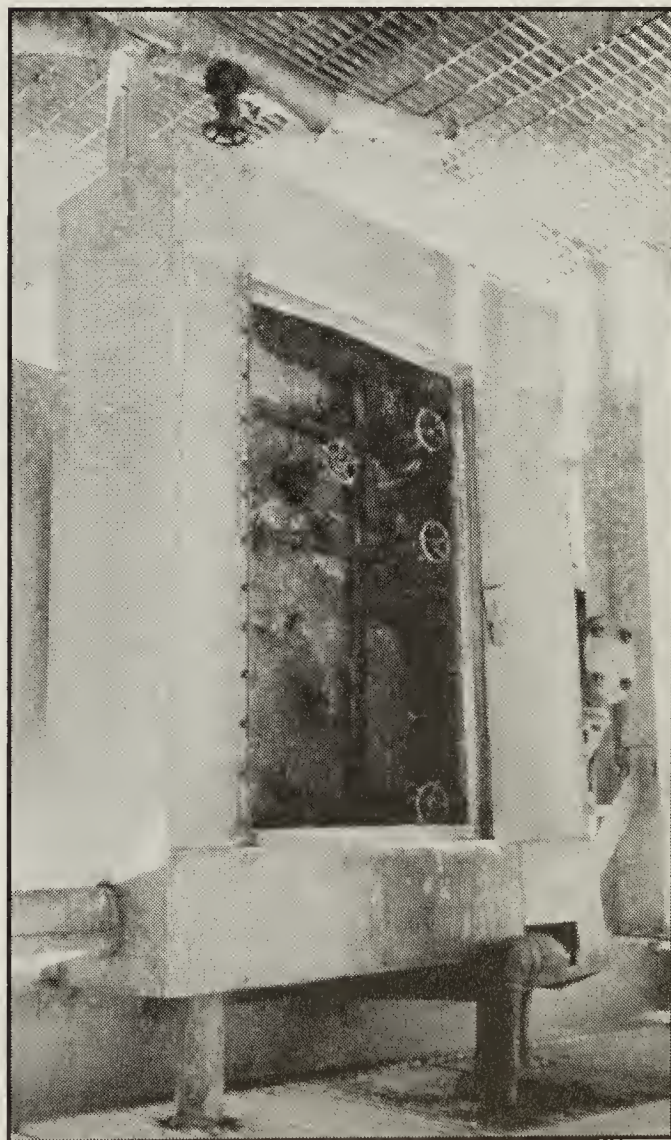
Company Ltd. gas plant, just south of Crossfield, AB., approximately 45 km north of Calgary, AB. Unfortunately, neither the owlet or adults could be found during a visit on 15 May 1997 – a few days after the initial report. The plant shift crew also commented that the owls had nested successfully at the plant in 1996. In the 1998 breeding season, two young of normal age were banded during a visit on 5 May. The nest is vacant in 1999.

The nest location is near the top of a metal pipe rack tower, approximately 12 m above the ground (Fig. 2). The actual nest site is located in a “hot box” near the top of the tower, below the smaller pipe coming in from the right and just above the larger pipe situated above the left horizontal tank. Inside the box is a network of utility and process piping wrapped with a considerable amount of insulation. This probably provided additional warmth to the nest area and possibly influenced the selection of this site. To the left side of the various valves and pipes is the nest, already vacated by the young. The nest sits on the middle of three valves near the middle of the upright hot box (Fig. 3). Our best guess is that the nest was built by Rock Doves (*Columba livia*) in 1995 or earlier. Additional nest materials were minimal and included small twigs and dried grasses. Large quantities of pellets were present.

Great Horned Owls occasionally use human-made structures. These include nest baskets,<sup>8</sup> nest tires on poles or trees,<sup>6</sup> metal bridges,<sup>1</sup> platforms,<sup>2,4</sup> and various buildings that include barns, granaries, sheds and houses.<sup>3</sup> In Saskatchewan, 53 of 2,923 nests (1.8%) were in human-made structures,<sup>4</sup> while near Cincinnati, Ohio, 54 of 738 nests (7.3%) were human-made.<sup>2</sup>

## Conclusion

The use of unusual nest sites can be a consideration when managing habitat for wildlife. Wildlife must continually try to adapt to the changes humans make to the environment. Several species use human-made structures, some of which are specifically designed as management tools, while others are used naturally. Although the Great Horned Owl occasionally attacks people approaching a nest, it never deserts its nest because of such visits. Use of the Johnston Canyon and Amoco nest sites appears to have caused little stress to the owls, and provides further evidence of the adaptability of the Great Horned Owl.



**Figure 3. Electrical hot box containing a Great Horned Owl nest, used successfully, 1996-1998.**

**Gordon Clayholt,  
taken after owls fledged**



## Acknowledgements

The authors graciously thank R.W. Campbell, C.S. Houston, and J.K. Schmutz for critically reviewing this manuscript and offering suggestions for improvement. We also thank G. Clayholt and other employees of Amoco Canada for their assistance. Thanks to D. Rowell of the Rockyview Wildlife Recovery center for informing us of the gas plant nest site. Our thanks also to C.S. Houston and E. Pletz for contributing helpful information on working with Great Horned Owls at the nest.

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One swallow does not a summer make, but one skein of geese, cleaving the murk of a March thaw, is the spring. Aldo Leopold.



# SASKATCHEWAN'S FIRST SWAINSON'S HAWK WITH SATELLITE RADIO

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Not all ornithologists would agree with Coulson that bird banding represents "the greatest advance in the study of birds in the 20<sup>th</sup> century"<sup>1</sup> but banding has nonetheless given us much valuable information about where birds go and how long they live. Some of banding's most interesting results involve those birds that travel farthest, such as the Arctic Tern (known as early as 1939 from twelve recoveries to make a figure-eight passage of the Atlantic Ocean, reaching to Antarctica)<sup>4</sup>; Peregrine Falcon,<sup>2, 6</sup> and Swainson's Hawk.<sup>5</sup>

Recoveries of aluminum leg bands have demonstrated the general progress of the southward migration of Swainson's hawks, but the speed of migration of any individual hawk was not known, and many fewer band recoveries were obtained on the return journey northward. The newer technology of radio satellite tracking of two hawks from Alberta in 1995 demonstrated that these hawks travelled over 10,000 km south to Argentina in 53 and 54 days, respectively. Radio signals were obtained at the "farthest south" locality reached by each hawk on 1 and 3 December, but the radios ceased sending signals by the time for the return journey. Details of the accuracy of these radio signals were provided in the initial article.<sup>5</sup>

Saskatchewan's participation in the expanded radio-satellite program became possible in 1996. To trap the

adult Swainson's Hawks at their nests and apply the backpack radio and harness a week or so before the young are ready to fledge, one places a live Great Horned Owl on the ground near the nest; the anxious parent hawk stoops at the owl and is caught unharmed in a dho-ghaza net. Marc Bechard flew up from Boise, Idaho, and Ursula Banasch of the Canadian Wildlife Service came down from Edmonton. Dr. Colette Wheler of the Western College of Veterinary Medicine loaned a captive Great Horned Owl. Such imported expertise was essential because the experience of CSH in live-trapping adult raptors at their nests had been limited to use of noose-carpets in trapping 32 adult Ospreys on their nests, prior to eggs hatching, in 1988, 1989 and 1990.<sup>3</sup>

It took the better part of two days to trap two adult Swainson's Hawks. The first adult female hawk was captured 5 km west and over 5 km north of Kindersley on 27 July; radio 25158 (weighing 28 g, less than 3% of its body weight), and aluminum leg band 1807-12825 were applied. The second adult was captured on 28 July, 34 km south and 10 km east of Alsask and given radio 25159.

In total, thirty-six transmitters were applied to adult hawks in 1996 — in two provinces and eight states, including Alberta (5), Saskatchewan (2), Minnesota (2), Idaho (6), Oregon (6), Utah (3), Colorado (3), California (1), and



Arizona (2).<sup>2</sup> Most radios performed well. Only two radios failed (or that particular hawk died before it could leave its banding site); unfortunately one of these was our hawk banded south-southeast of Alsask, and the other was a hawk from Oregon. The remaining 28 hawks were followed to South America; three got only to Bolivia (with last signals on 27 November and 2 December, but intermittently through 27 May 1997 for the third), while 25 went all the way to Argentina. Most radios were programmed to send a signal (one to four times in eight hours) every sixth day.

What a thrill it was to receive, each week, an e-mail message giving the locations of all 30 hawks. Unlike the 1995 radios, 19 radios sent signals until May, allowing the return northward trips to be plotted for the first time.

The adult female hawk from northwest of Kindersley ranged within a few miles of its nest site for almost exactly one month until 26 August, no doubt feeding its young in and then out of the nest. The next signals came on 3 September at 1.58 p.m. from 5 km northwest of Snipe Lake village, a first movement of 45 km from its nest. During the remainder of that day it apparently continued on southeast another 30 km, being recorded 5 km southeast of Snipe Lake at 3.38 p.m., then 3 km west and 7 km north of Isham at 5.48 p.m. and finally 3 km west but only 2.5 km north of Isham at 7.26 p.m. With the next signals early on 10 September, the hawk had moved little in six intervening days from the previous signals; it was only 3 km south of Isham. On September 22 at 7.46 and again at 9.25 a.m., it was near the hamlet of Sanctuary (see Figure 1), now 110 km from its nest. By 11.05 a.m. it was near Saskatchewan Landing and by 1.49 p.m. was near Shamrock. These three locations and all subsequent locations through to

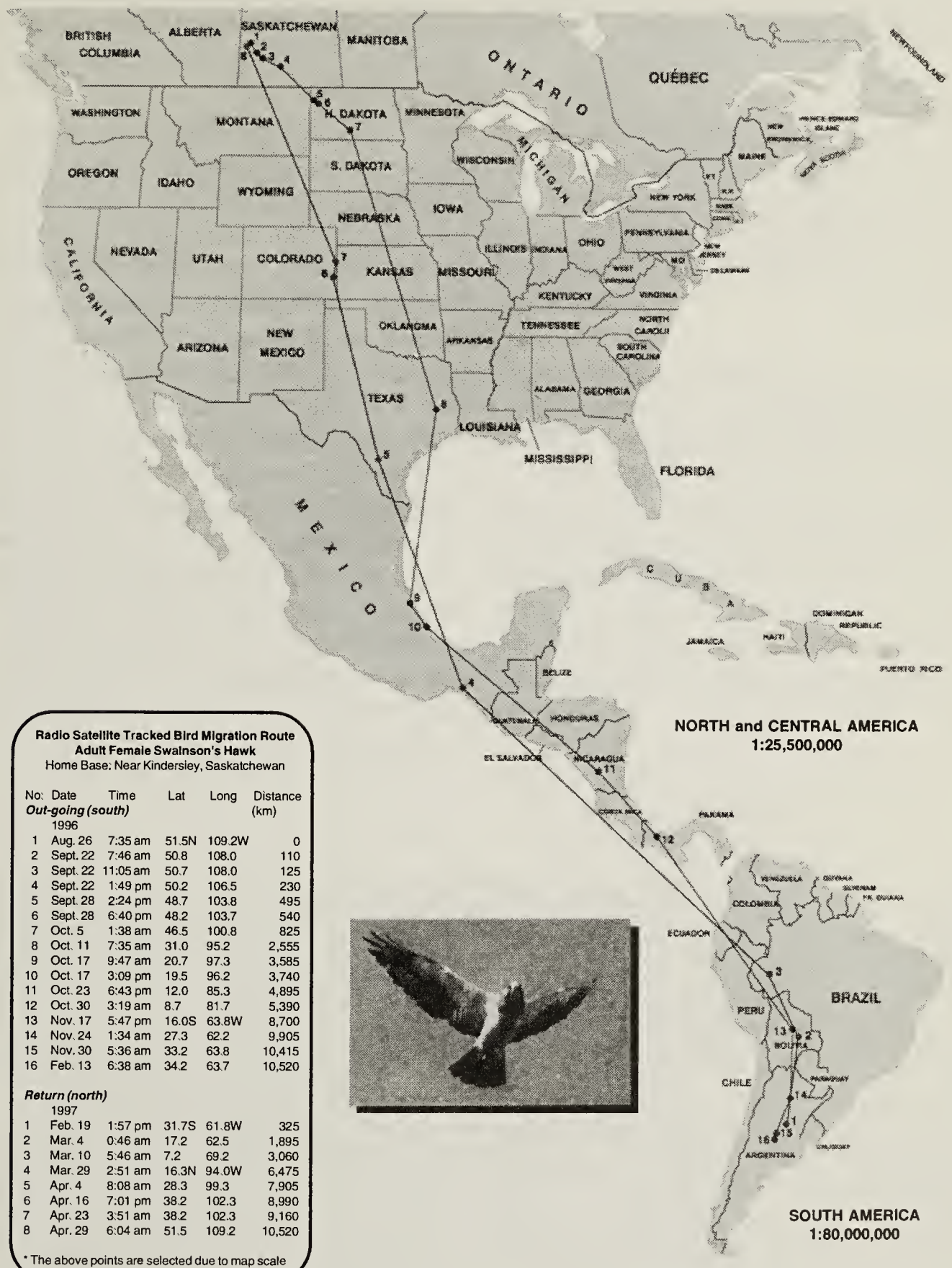
Argentina are shown on the map and in the accompanying table. The quickest leg of the trip was from south of Bismark, North Dakota, to Groveton, Texas, a distance of 1730 km between 5 and 11 October, or an average of 288 km each day. (We have no way of knowing whether or not it flew every day). It did not reach its wintering quarters in Argentina until 30 November, and it stayed in that locality for only about ten weeks. Before returning, the hawk on 13 February 1997 took a brief visit about 20 km south of where it had spent most of the winter.

The return journey provided the first-ever accurate figures for travel speed on the northward route. The return journey began with a short 325 km trip within Argentina in the first six days, then an additional 50 km by 26 February, then another 1480 km into Bolivia by 4 March and 1330 km to the Upper Amazon area of Brazil by 10 March. No reports came from the "blind area" in northern South America, where few satellites are available for receiving. It reached Chiapas, Mexico on 29 March, Cotulla, Texas on 4 April and Lamar, Colorado on 16 April. It rested in good buteo country in southeast Colorado, moving only another 170 km north by 23 April. Then a big flight of 1575 km in six days (263 km/day) brought it back to its nest near Kindersley, where it was in residence as determined by a visual inspection from the ground. Sadly, it raised no young in 1997. The last radio signal was received by satellite on 24 June, a radio life of 11 months. Radio life is unpredictable, because radios on one hawk from Idaho and another from Oregon lasted for two complete trips to Argentina and back, until 22 and 12 July 1998, respectively.

The map (Figure 1) shows the main locations and dates of both the



FIGURE 1 - SWAINSON'S HAWK MIGRATION



southward and northward travel, following essentially the same route both times. This map will appear in the second edition of *The Atlas of Saskatchewan*, due off the presses later in 1999.

## Acknowledgements

This study was possible only through the generosity of Marc Bechard and Ursula Banasch. Dr. Colette Wheler of the Western College of Veterinary



Medicine loaned the captive Great Horned Owl and Ursula Banasch brought the dho-gaza nets. Sequences of the hawk captures appeared in the video production, *Twixt Heaven and Earth*, produced by Donna Caruso's Incandescent Films of Fort Qu'Appelle. This video was broadcast by Discovery Channel Canada and the Saskatchewan Cable Network. Copies may be purchased from the National Film Board in Montreal.

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The Best Out of Life, by Ruth and Peter McIntock:  
Reprinted from *Blue Jay* 7(2):2, June 1949.

"And these days when after six bleak months of Saskatchewan winter 'all suddenly the wind comes soft and spring is here again.' there rises in all of us, even the most citified, the urge to get out of doors again; to hear the first robin; to find the first purple crocus; to explore for the first time the simple, varied joys that nature offers for her followers. Like Donald Culross Peattie, they will discover that:

'A man need not know how to name all the oaks or the moths, or to be able to recognize a synclinal fault, or to tell time by the stars, in order to possess nature. He may have his mind solely on growing larkspurs, or he may love a boat and a sail and a blue-eyed day at sea. He may have a bent for making paths, or banding birds, or he may be an inveterate and curious walker. But such a fellow has the best of life.'



# BROWN-HEADED COWBIRD PARASITIZES UPLAND SANDPIPER NEST

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The Brown-headed Cowbird (hereafter cowbird) is an obligate brood parasite that lays its eggs in the nests of other birds, the hosts. Cowbirds are known to have parasitized over 220 species of birds, of which at least 144 species have reared cowbird young <sup>3</sup>. Although cowbirds typically parasitize passerine hosts <sup>7</sup>, occasionally they lay in nests of non-passerine species. Friedmann and Kiff <sup>3</sup> documented parasitism on such unusual species as Ferruginous Hawk, California Gull, Red-headed Woodpecker and Ruby-throated Hummingbird. Equally unusual are the

documented instances of cowbirds parasitizing species with precocial young, such as Blue-winged Teal and Virginia Rail <sup>3</sup>. We document the fourth record of Brown-headed Cowbird parasitism on the Upland Sandpiper, a precocial species.

On 6 July 1991, while searching for Ferruginous Hawk nests in a pasture southeast of Pipestone, Manitoba, we flushed an Upland Sandpiper from its nest. Typical of Upland Sandpipers <sup>2</sup>, the adult vocalized upon leaving the nest and gave an injury-feigning distraction



**Figure 1. Upland Sandpiper nest with a newly hatched young, three sandpiper eggs, and a cowbird egg.**



display. Upon inspecting the nest we were surprised to see one newly-hatched sandpiper, three pipped sandpiper eggs, and a cowbird egg lying near the inner edge of the nest (Fig. 1). We returned to the site two days later but were unable to relocate the nest to confirm the fate of the cowbird egg.

Cowbird eggs have been recorded infrequently in nests of other shorebird species: Killdeer (two instances), Spotted Sandpiper (five instances), and Wilson's Phalarope (three instances) <sup>3</sup>. Friedmann <sup>4</sup> reported an Upland Sandpiper nest in Minnesota that contained four host eggs, and one cowbird egg that was partially buried in the bottom of the nest. Two additional Upland Sandpiper nests from North Dakota contained three host eggs along with single cowbird eggs <sup>5,6</sup>. Because Upland Sandpipers typically lay four eggs <sup>1,6</sup>, Higgins <sup>5</sup> suggested that the cowbird may have removed a sandpiper egg from the nest. In both cases, however, it was not known for certain whether the sandpipers laid only three eggs. Furthermore, it is unlikely that a cowbird could remove such a large egg (S. G. Sealy pers. comm.).

Cowbird parasitism on inappropriate hosts is interesting in itself, but one wonders why a cowbird would lay an egg in a nest where there is no chance for the egg to survive. We offer three possible explanations for this behaviour. First, cowbirds may opportunistically "dump" their eggs in inappropriate nests when no suitable hosts are available at the time of egg laying. Second, the high fecundity of some cowbird populations (over 40 eggs laid per breeding season <sup>8</sup>) may allow cowbirds to parasitize novel hosts in an attempt to assess host suitability, at a low reproductive cost. Although the mechanism is unknown, cowbirds may have employed such a strategy as they encountered new hosts

during their range expansion. Third, this behaviour may reflect variation in the effectiveness of individual cowbirds within the population, that is, even cowbirds make mistakes.

## Acknowledgements

Comments by Spencer G. Sealy, D. Glen McMaster and Robert W. Nero greatly improved the manuscript.

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# CURVE-BILLED THRASHER WINTERS IN ST. CLAUDE, MANITOBA

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The phone rang as I sat on the bench in our front porch, enjoying the spring sun on the afternoon of 20 March 1999. No sense in rushing inside; if it is important, they'll leave a message, I thought. A short time later I checked. Heidi den Haan, who is the librarian at the Delta Waterfowl and Wetlands Research Station when she is not banding birds, had left a message discussing my upcoming visit to the library. Almost as an afterthought she mentioned that there was a Curve-billed Thrasher in St. Claude and that she had left details with Gordon Grief, a Winnipeg birder. That got my attention!

After a frantic half-hour, while Gord's line was busy, I got through. Robert Jones, Joyce Tomchuk and Heidi, after trying unsuccessfully on the 18<sup>th</sup>, had this

morning seen the bird, confirmed the identity, and taken photographs at the feeders of Renee and Louis Hebert of 147 Birch Street. It was too late in the day to try for the bird now, but well before 9:00 a.m. the next morning I arrived, even though the visitor was not expected at the feeder until 11:30. Soon Wayne Neily joined me; we scoured the streets and back-lanes in the area. Pine Siskins, American Goldfinches and a few redpolls attracted our interest, but no thrasher. As the appointed hour neared, more birders arrived and soon the back-lane behind the Hebert home held a crowd of over twenty, while several more birders were inside. Such a gathering would attract attention anywhere and several St. Claude residents came to join us. They knew already about the rarity in town and could fill us in with the details.



*Curve-billed Thrasher*

*Dennis Fast*



Margaret and Henri Dacquay, next-door neighbours of the Heberts, had first noticed the bird in early November 1998. It visited their feeders frequently, until the food ( sunflower seeds and millet ) ran out, but there were several other feeders in the area where it was also seen. During the cold weather between mid-December and mid-January it became rather inactive and spent a lot of time perched, fluffed-up, in a large oak between the Hebert and Dacquay homes. With the advent of warmer weather it had once more become quite active. Mr. Dacquay told us that he had not been able to identify the bird, as it was not illustrated in Godfrey's Birds of Canada.<sup>3</sup> The closest he had come was the Black-billed Cuckoo, so he called it the "cuckoo bird", realizing however the shortcomings of his identification. Eventually Raymond Chattel identified it and through the grapevine the news reached the birding community. A Cooper's Hawk came over, 11:30 came and went.

Then, at 11:35 a.m., there was the thrasher, perched in a tree between the feeders. It surveyed the scene rather warily, and remained in the tree for about a minute. The crowd in the back lane was remarkably restrained, but some excited noises emanated from the house. The thrasher was about the size and shape of a Brown Thrasher. Its overall colouration was a light grey-brown, with somewhat paler underparts. The wings showed two rather indistinct whitish wing-bars, the throat was white and the breast dusky grey, with some darker mottling or streaking. This streaking was more pronounced on the lower breast and upper abdomen. The lower abdomen and undertail coverts were pale, with little hint of buffy or rufous as shown in some field guides.<sup>5</sup> The under-surface of the long tail feathers showed distinct, large areas of white at the tip. The bill was strikingly long, down-curved and black, while the

eyes were orange. The bird next hopped onto one of the feeders, gobbled up a few shelled peanuts and flew off into nearby shrubbery.

Although several of us waited for up to half-an-hour, it did not come back. A check of the shrubs revealed nothing and the bird had disappeared as furtively as it had first appeared. In the next few days several others managed to see it, but as the weather warmed, they had to wait longer and longer for its infrequent visits.

The markings on the bird seemed to indicate that it belonged to the "*curvirostre*" race, except for the breast colouration, which was more like that of the "*palmeri*" race, as shown in the National Geographic guide.<sup>5</sup> Whatever the race, the thrasher was a long way from home, its nearest breeding areas being in extreme southern Colorado and the Panhandle of Oklahoma. It has a history of wandering, with sightings reported from as far north as Idaho, South Dakota, Minnesota and Wisconsin.<sup>1</sup> There was a reported sighting on 27 July 1986 at Raymore in Saskatchewan, but the viewing conditions had been less than ideal and only one observer was involved.<sup>4</sup> Such sightings have to be considered hypothetical. However, since late August or early September 1998 a Curve-billed Thrasher was present in the town of Barrhead, Alberta, 100 km northwest of Edmonton. Like the St. Claude bird, it was not identified until much later, early winter in this case.<sup>2</sup> It attracted a lot of attention and listers from across Canada came to visit. It, too, survived the winter.

It is difficult to attribute the presence of the two birds to any single phenomenon. Much of the American Southwest experienced a dry summer, but as the thrashers apparently arrived



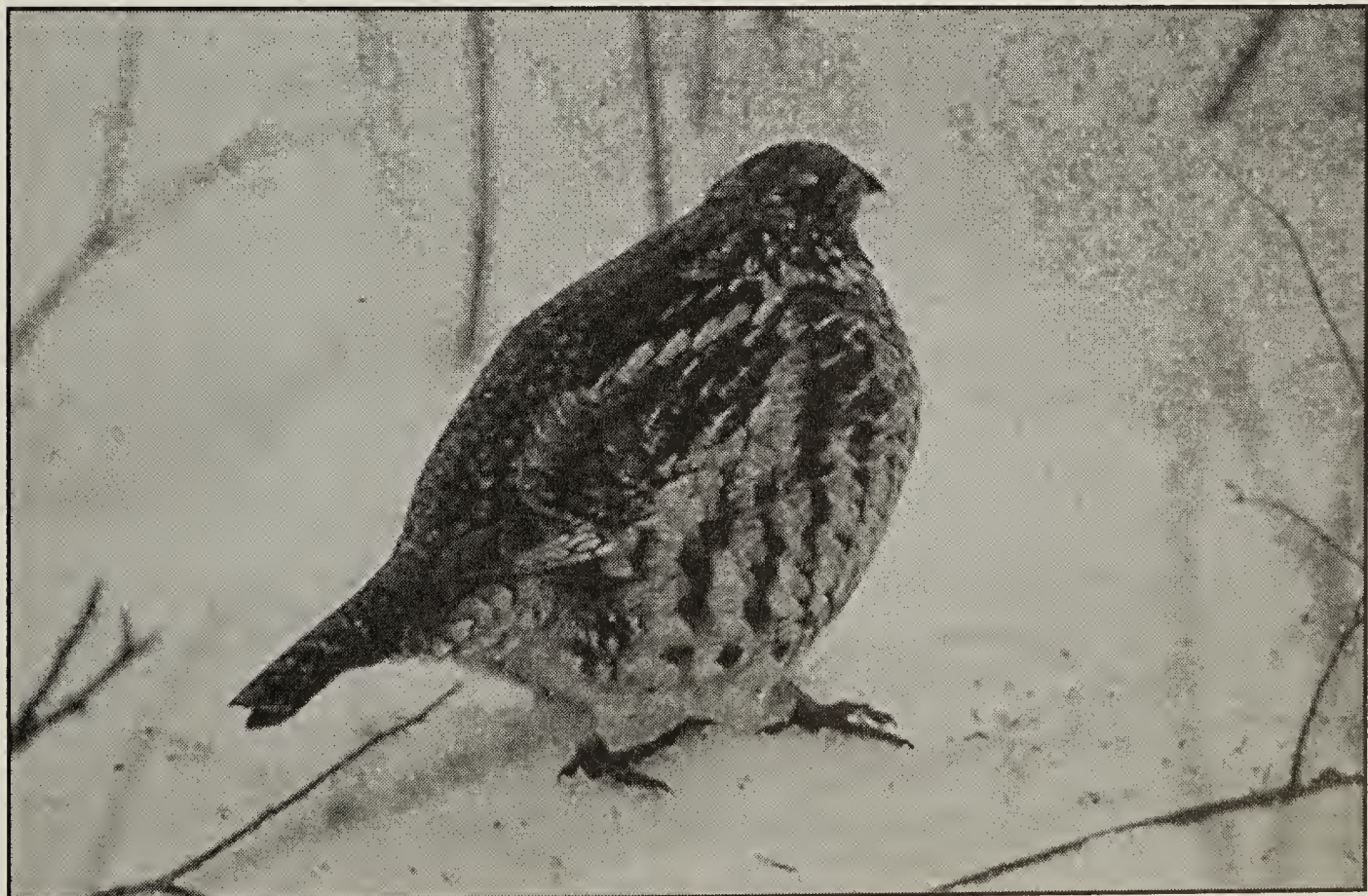
at different times, this may have had little to do with it. Similarly, no single storm with southerly winds could account for this. Most likely, it was simply a matter of sheer, amazing coincidence.

If accepted by the provincial bird records committees, these two occurrences will represent the first confirmed records for Canada.

### Acknowledgements

I would like to thank Renee and Louis Hebert and Margaret and Henri Dacquay for helping the thrasher survive the Manitoba winter. Thanks also to Heidi den Haan for informing members of the Manitoba Rare Bird Alert, to Dennis Fast for the use of one of his photographs of the bird and to Bob Nero for urging me to write this note.

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***Ruffed Grouse, Beauvais L. Prov. Park***

***Teresa Dolman***



# BIRD OBSERVATIONS FROM THE MCLEOD RIVER AND ITS HEADWATER TRIBUTARIES, ALBERTA

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Here, I report on breeding birds observed while conducting field work on the upper McLeod River system (52° 56' N, 117° 17' W) and associated headwater tributaries during the period 18 - 23 June 1998. Bounded by Cardinal Divide to the south, the study area includes the McLeod River to its junction with Whitehorse Creek and the headwater tributaries: Harris Creek, Unnamed "J" Creek (immediately northwest of Harris Creek), and Thornton and Cheviot Creeks. Sightings from a brief visit to an alpine plateau below Cheviot Mountain are also presented here. Situated a few

kilometers east of Jasper National Park, this unique arctic-like setting is planned to be developed as a large-scale coal mine (Cardinal River Coals Ltd.).

Forty-three species were observed, of which thirty-two (74%) were passerines. Three species (Cliff Swallow, *Hirundo pyrrhonota*, American Dipper, *Cinclus mexicanus*, Wilson's Warbler, *Wilsonia pusilla*) were confirmed breeding with the discovery of active nests (details below).

The species accounts that follow are in taxonomic order (American



**Figure 1 - Breeding Harlequin Duck habitat, Harris Creek and McLeod River confluence, Alberta, June 1998.**

**Kenneth G. Wright**



Ornithologists' Union 1998). An asterisk (\*) precedes the common name of species confirmed breeding. Number of records for each bird species is listed as one, two or multiple observations (>2). A short description of habitat and other relevant notes are included.

**Harlequin Duck** (*Histrionicus histrionicus*). Multiple obs. Females seen using Harris Creek, Unnamed "J" Creek, and the McLeod River adjacent to Prospect Creek, upstream of Prospect Creek and upstream of Thornton Creek, and especially the Harris Creek confluence area (Fig. 1)(Wright 1998). This species is known for its significant breeding population in the area (MacCallum 1997, MacCallum and Bugera 1998).

**Common Merganser** (*Mergus merganser*). Two records. Male seen at the Harris Creek / McLeod River confluence. A female on the McLeod River adjacent to Prospect Creek was also observed (23 June).

**Northern Harrier** (*Circus cyaneus*). Two records. An adult male was seen carrying a small mammal over lower Harris Creek (22 June) - possibly nest provisioning.

**Northern Goshawk** (*Accipiter gentilis*). One record. I heard a bird calling in dense spruce (*Picea* spp.) above a settling pond in Cheviot Creek. Possibly nesting.

**Golden Eagle** (*Aquila chrysaetos*). One record. Immature circling over Harris Creek, approximately 0.5 km upstream of McLeod River (23 June). Repeatedly mobbed by a male Northern Harrier.

**Spotted Sandpiper** (*Actitis macularia*). Multiple obs. Seen daily on specific stretches of the McLeod River and Harris and Thornton Creeks. Usually on creek banks and gravel bars, however some use of upland habitats in Harris Creek was noted.

**Common Snipe** (*Gallinago gallinago*). Multiple obs. Heard on several

occasions *winnowing* near the McLeod River / Harris Creek confluence. Also flushed from wet meadows west of Thornton Creek. Maximum of 3 individuals observed at one site.

**Great Horned Owl** (*Bubo virginianus*). One record. Observed at dusk near Thornton Creek flying over the upper McLeod River (18 June).

**Three-toed Woodpecker** (*Picoides tridactyla*). Two records. Upper Cheviot Creek area in mature spruce forest.

**Northern Flicker** (*Colaptes auratus*). Multiple obs.

**Pileated Woodpecker** (*Dryocopus pileatus*). One record. Thornton Creek.

**Olive-sided Flycatcher** (*Contopus borealis*). One record. Heard calling on the dry, west-facing slope of Mt. Harris, among old burned spruce snags (21 June).

**Dusky Flycatcher** (*Empidonax oberholseri*). Multiple obs. This species is confined mainly to the Rocky Mountain Foothill regions of Alberta (Semenchuk 1992).

**Horned Lark** (*Eremophila alpestris*). One record. Three individuals sighted on alpine plateau east of Cheviot Mountain (22 June).

**Gray Jay** (*Perisoreus canadensis*). Multiple obs.

**Common Raven** (*Corvus corax*). Multiple obs.

**\*Cliff Swallow** (*Hirundo pyrrhonota*). Multiple obs. Locally common at vehicle bridge at McLeod River and Harris Creek where a nesting colony was present. Maximum count: > 50 individuals.

**Boreal Chickadee** (*Parus hudsonicus*). One record. Cheviot Creek.

**\*American Dipper** (*Cinclus mexicanus*). Multiple obs. Frequently observed near the confluence of Harris Creek and McLeod River. Nest located under crossing over McLeod River, 50 m upstream of Harris Creek. Birds seen making provisioning trips up Harris Creek, unnamed "J" Creek and



Thornton Creek. Favoured fast-flowing reaches with some exposed instream cobbles. Dippers are confined to the Rocky Mountain and Foothills regions (Semenchuk 1992).

**Ruby-crowned Kinglet** (*Regulus calendula*). Multiple obs. Cardinal Divide and Cheviot Creek.

**Mountain Bluebird** (*Sialia currucoides*). One record. A male observed at Cardinal Divide (20 June).

**Gray-cheeked Thrush** (*Catharus minimus*). Two records. One singing male 18 June in tall willow (*Salix spp.*) on south side of McLeod River approximately 1.5 km east of Prospect Creek. Another record of 2-3 birds singing in tall willow on the lower reach of Cheviot Creek (22 June). This species is mainly a migrant in Alberta (Salt and Salt 1976, Semenchuk 1992) however, they have been documented singing during the breeding season in the Rockies at Amethyst Lake, Jasper National Park (Van Tighem and Holroyd 1981) and Lake Louise, Banff National Park (McNicholl 1985). No definite breeding records exist for Alberta, however these observations and those reported from the Caribou Mountains of northern Alberta (Hohn and Burns 1975, Hohn and Marklevitz 1974) strongly suggest that localized breeding occurs.

**Swainson's Thrush** (*Catharus ustulatus*). One record. Cheviot Creek.

**Hermit Thrush** (*Catharus guttatus*). One record. Cheviot Creek.

**American Robin** (*Turdus migratorius*). One record.

**Varied Thrush** (*Ixoreus naevius*). One record. One bird heard (22 June) in spruce draw above Cheviot Creek settling pond. Distribution is primarily in the Rocky Mountain and Foothills regions (Semenchuk 1992).

**American Pipit** (*Anthus rubescens*). One record. Three individuals on alpine plateau east of Cheviot Mountain (22 June).

**Tennessee Warbler** (*Vermivora peregrina*). Multiple obs. Fairly common in tall willow openings in spruce forest near Prospect Creek.

**Yellow-rumped Warbler** (*Dendroica coronata*). Multiple obs.

**Northern Waterthrush** (*Seiurus noveboracensis*). One record.

**\*Wilson's Warbler** (*Wilsonia pusilla*). Multiple obs. Most common warbler. Particularly abundant in the dwarf birch/willow habitat along streams (Fig. 2). A nest containing 5 eggs was found (21 June) on the ground below a small (<30 cm high) Engelmann Spruce (*Picea engelmanni*). The nest was located approximately 100 m up Thornton Creek and was facing east. Female observed incubating at 1130 hours on 22 June. This species is an abundant breeder in the Rocky Mountain region (Semenchuk 1992).

**Western Tanager** (*Piranga ludoviciana*). One record. Cheviot Creek.

**Chipping Sparrow** (*Spizella passerina*). Multiple obs. Fairly common in spruce forest.

**Clay-coloured Sparrow** (*Spizella pallida*). Multiple obs.

**Brewer's Sparrow** (*Spizella breweri tavernei*). Multiple obs. This subspecies, formerly designated as a unique species (Timberline Sparrow) is confined to the Rocky Mountain Parks and adjacent mountain habitats (Semenchuk 1992). Little is presently known about its distribution in Alberta.

**Savannah Sparrow** (*Passerculus sandwichensis*). Multiple obs. At least two individuals observed at Harris Creek / McLeod River confluence.

**Fox Sparrow** (*Passerella iliaca*). Multiple obs.

**Lincoln's Sparrow** (*Melospiza lincolni*). Multiple obs.

**Golden-crowned Sparrow** (*Zonotrichia atricapilla*). One record. Treeline on upper Cheviot Creek. Distributed primarily in the Rocky Mountain region



(Semenchuk 1992).

**White-crowned Sparrow** (*Zonotrichia leucophrys*). Multiple obs. Very common in dwarf birch (*Betula glandulosa*) and willow meadows throughout the upper McLeod area. Likely the most common passerine in the study area.

**Dark-eyed Junco** (*Junco hyemalis*). Multiple obs. Fairly common in spruce forest and edge habitats.

**White-winged Crossbill** (*Loxia leucoptera*). One record. Male seen flying at treeline on upper Cheviot Creek.

**American Goldfinch** (*Carduelis tristis*). One record. Harris Creek.

A rich avifauna (43 species) was observed in the upper McLeod River and associated tributaries during the period 18-23 June 1998. This area contains elements suitable for several species with a limited and patchy distribution. In particular, the area supports a significant Harlequin Duck breeding population, estimated at  $58 \pm 7$  individuals

(MacCallum 1997). Harlequin Ducks are presently considered "Yellow listed" (species of management concern; Anonymous 1996) in Alberta and recent concerns over a possible declining population in British Columbia have stimulated several population studies. The Northern Goshawk observed giving a territorial call in Cheviot Creek may have been nesting in the spruce forest there. Northern Goshawks are not currently designated at risk in Alberta, however the subspecies *A. g. laingi* is considered threatened (Red list) in neighbouring British Columbia (Fraser and Cannings 1998). Little is known on the breeding distribution of the Gray-cheeked Thrush and Brewer's Sparrow in Alberta and the paucity of such records indicates a small population and patchy occurrence.

At present, a large-scale open pit coal mine development is imminently planned for the area, threatening many of the region's unique birds and habitats.



**Figure 2 - Wilson's Warbler habitat, Harris Creek, Alberta, June 1998.**  
Kenneth G. Wright.



Further work is urgently required to document the breeding status of the region's unique avifauna, in particular nesting confirmation for the Gray-cheeked Thrush and Brewer's Sparrow.

## Acknowledgements

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## A FLORISTIC INVENTORY OF THE MCLENNAN LAKE AREA, SASKATCHEWAN

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In June of 1998 I was able to explore the McLennan Lake area, north of La Ronge, Saskatchewan. This part of the province is in the Boreal Shield ecoregion.<sup>2</sup> The Shield is much different in appearance than the Boreal Plain ecoregion to the south, which is covered by thick glacial till. The Boreal Shield has greater topographical changes, and exposed Precambrian rock outcrops and cliffs. The soils are thin relative to those in the Boreal Plain, especially near tops of hills. While exploring rock outcrops it often amazed me that there was such

a diversity of flora growing in such little soil.

Black spruce (*Picea glauca*) and trembling aspen (*Populus tremuloides*) dominate the forests in the McLennan Lake area. Jack pine (*Pinus banksiana*) is the other most common tree -species. White spruce (*Picea glauca*) and tamarack (*Larix laricina*), while present, are relatively uncommon. An incredible diversity of understory vegetation is present including attractive mosses and lichens too numerous to count. Dry ground cranberry (*Vaccinium vitis-idaea*



**Figure 1 - Stemless lady's-slipper and associated habitat**

**Diana Bizecki Robson**





**Figure 2 - Lichen-covered rock outcrop**

**Diana Bizecki Robson**

var. *minor*) is the most common understory plant. This species produces large quantities of berries that are an important food source for mammals indigenous to the area like the Black Bear and Western Chipmunk. Other common understory vascular plants are club mosses (*Lycopodium* spp.), wintergreens (*Pyrola* spp.), bunchberry (*Cornus canadensis*), cloudberry (*Rubus chamaemorus*) and western Canada violet (*Viola rugulosa*). The beautiful stemless lady's-slipper (*Cypripedium acaule*) can sometimes be found in open jack pine stands among the reindeer moss (*Cladina* spp.) and dry ground cranberry (Figure 1). In ravines connecting lakes together, beautiful communities of ferns, (three of them considered rare in the province), berry-producing shrubs and sweet scented mints abound.

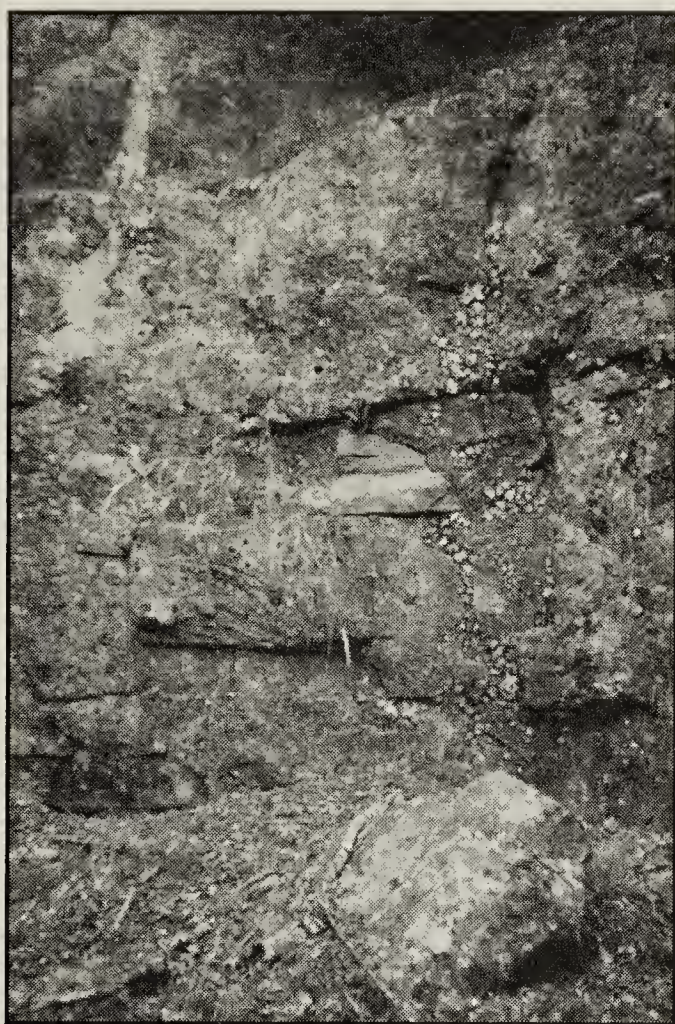
By far the most amazing places in the area are the granitic cliffs and hill tops—they are a lichen lover's paradise. Crustose (crust-forming), foliose (leaf-forming) and fruticose (branchlike) lichens of yellow, orange, brown, black

and green cover nearly every square inch of rock (Figure 2). Hardy vascular plants like three-toothed saxifrage (*Saxifraga tricuspidata*), blueberry (*Vaccinium angustifolium* var. *myrtilloides*), bristly sarsaparilla (*Aralia hispida*), rusty woodsia (*Woodsia ilvensis*) and parsley fern (*Cryptogramma acrostichoides*) grow in tiny pockets of soil present in the rock cracks of cliffs (Figure 3).

My floristic survey revealed that there were 109 species of vascular plants present in the area. However, there are likely more species present since later blooming plants would not have been visible when I visited the area. Thus, this list should not be considered complete; merely a starting point for further study. Some of the moss and lichen genera and species discovered while exploring this area were also recorded. Since only a brief study of the bryophytes and lichens was conducted many more species are likely present.

All vascular plant species were collected, except those marked with an asterisk, and were donated to the W.P.





**Figure 3 - A lichen and fern covered cliff**  
**Diana Bizecki Robson**

Fraser Herbarium at the University of Saskatchewan in Saskatoon. The lichen specimens were donated to Dr. John Sheard's lichen herbarium at the University of Saskatchewan. Nomenclature follows Kartesz and Kartesz.<sup>1</sup> Plants considered rare by the Saskatchewan Conservation Data Centre are in bold-faced type.

## **CHECKLIST OF THE FLORA OF THE MCLENNAN LAKE AREA**

### PLANTAE - PLANT KINGDOM

#### **TRACHEOPHYTA - Vascular Plants**

#### PTERIDOPHYTA - Ferns and Fern Allies

#### POLYPODIACEAE - Fern Family

***Athyrium filix-femina* (L.) Roth - Lady fern**

*Cryptogramma acrostichoides* R.Br. - Parsley fern

*Cystopteris fragilis* (L.) Bernh. - Fragile fern

***Dryopteris cristata* (L.) Gray - Crested shield fern**

***Dryopteris phegopteris* (L.) Schott - Beech-fern**

*Gymnocarpium dryopteris* (L.) Newm. - Oak fern

*Polypodium virginianum* (L.) D.C. Eaton - Common rock tripe

*Woodsia ilvensis* (L.) R.Br. - Rusty woodsia

#### **EQUISETACEAE - Horsetail Family**

*Equisetum hyemale* L. - Common scouring-rush

*Equisetum sylvaticum* L. - Woodland horsetail

#### **LYCOPODIACEAE - Club-moss Family**

*Lycopodium annotinum* L. - Stiff club-moss

*Lycopodium clavatum* L. - Running-pine

*Lycopodium complanatum* L. - Trailing club-moss

*Lycopodium obscurum* L. - Ground-pine

## **SPERMATOPHYTA - Seed-bearing Plants**

### TREES

#### PINACEAE - Pine Family

*Larix laricina* (DuRoi) K. Koch - Tamarack \*

*Picea glauca* (Moench) Voss - White spruce \*

*Picea mariana* (Mill.) BSP. - Black spruce

*Pinus banksiana* Lamb. - Jack pine

#### **SALICACEAE - Willow Family**

*Populus balsamifera* L. - Balsam poplar

*Populus tremuloides* Michx, Trembling aspen

#### BETULACEAE - Birch Family

*Betula occidentalis* Hook. - River birch

*Betula papyrifera* Marsh. - White birch

### SHRUBS

#### CUPRESSACEAE - Cypress Family

*Juniperus communis* L. - Low juniper

#### BETULACEAE - Birch Family



*Alnus viridis* (Chaix) DC. - Green alder  
 MYRICACEAE - Bayberry Family  
*Myrica gale* L. - Sweet gale  
 CORNACEAE - Dogwood Family  
*Cornus sericea* L. - Red-osier dogwood  
 ERICACEAE - Heath Family  
*Arctostaphylos uva-ursi* (L.) Spreng. -  
 Bearberry  
*Chamaedaphne calyculata* (L.) Moench.  
 - Leatherleaf  
*Gaultheria hispidula* (L.) Muhl. -  
 Creeping snowberry  
*Kalmia polifolia* Wang. - Pale laurel  
*Ledum groenlandicum* Oeder -  
 Labrador-tea  
*Oxycoccus microcarpus* Turcz. - Small  
 bog cranberry  
*Vaccinium vitis-idaea* L. var. *minus*  
 Lodd. - Dry ground cranberry  
*Vaccinium angustifolium* Ait. var.  
*myrtilloides* (Michx.) House - Blueberry

**CAPRIFOLIACEAE** - Honeysuckle  
 Family

*Viburnum edule* (Michx.) Raf - Low  
 bush-cranberry  
*Viburnum opulus* L. var. *americanum*  
 (Mill.) Ait. - High bush-cranberry  
 ROSACEAE - Rose Family  
*Prunus pensylvanica* L. - Pin cherry  
*Rosa acicularis* Lindl. - Prickly rose  
*Rubus idaeus* L. - Wild red raspberry  
 SAXIFRAGACEAE - Saxifrage Family  
*Ribes hudsonianum* Richards. -  
 Northern black currant  
*Ribes oxycanthoides* L. - Northern  
 gooseberry  
 SALICACEAE - Willow Family  
*Salix bebbiana* Sarg. - Beaked willow  
*Salix discolor* Muhl. - Pussy willow  
*Salix monticola* Bebb. - Mountain willow  
*Salix pedicellaris* Pursh - Bog willow

**HERBS**

TYPHACEAE - Cattail Family  
*Typha latifolia* L. - Common cattail  
**ARACEAE** - Arum. Family  
*Calla palustris* L. - Water calla

ORCHIDACEAE - Orchid Family  
*Cypripedium acaule* Ait. - Stemless  
 lady's-slipper  
*Goodyera repens* var. *repens* (L.) Br. -  
 Lesser rattlesnake-plantain  
 LILIACEAE - Lily Family  
*Maianthemum canadense* Desf - Two-  
 leaved Solomon's-seal  
 SANTALACEAE - Sandalwood Family  
*Geocaulon lividum* (Richards.) Fern -  
 Northern bastard toad-flax  
 POLYGONACEAE - Buckwheat Family  
*Polygonum cilinode* Michx. - Bindweed  
 RANUNCULACEAE - Crowfoot Family  
*Ranunculus reptans* L. - Creeping  
 buttercup  
 CORNACEAE - Dogwood Family  
*Cornus canadensis* L. - Bunchberry  
 ONAGRACEAE - Evening-primrose  
 Family  
*Epilobium angustifolium* L. - Fireweed  
 FUMARIACEAE - Fumitory Family  
*Corydalis sempervirens* (L.) Pers. - Pink  
 corydalis  
 MENYANTHACEAE - Buck-bean Family  
*Menyanthes trifoliata* L. - Buck-bean  
 ARALIACEAE - Ginseng Family  
*Aralia hispida* Vent. - Bristly sarsaparilla  
*Aralia nudicaulis* L. - Wild sarsaparilla  
 RUBIACEAE - Madder Family  
*Galium trifidum* L. - Small bedstraw  
 LAMIACEAE - Mint Family  
*Lycopus virginicus* L. var. *pauciflorus*  
 Benth - Northern water-horehound  
*Mentha arvensis* L. - Wild mint  
 LORANTHACEAE - Mistletoe Family  
*Arceuthobium* Bieb. spp. \* - Mistletoe  
 CARYOPHYLLACEAE - Pink Family  
*Stellaria calycantha* (Ledeb.) Bong -  
 Northern stitchwort.  
 POTAMOGETONACEAE - Pondweed  
 Family  
*Potamogeton praelongus* Wulf - White-  
 stem pondweed  
 PRIMULACEAE - Primrose Family  
*Trientalis borealis* Raf - Northern  
 Starflower  
 ROSACEAE - Rose Family  
*Comarum palustre* L. - Marsh cinquefoil  
*Potentilla norvegica* L. - Rough



cinquefoil

*Rubus chamaemorus* L. - Cloudberry

*Rubus pubescens* Raf - Dewberry

*Sibbaldiopsis tridentata* (Aiton) Rydb. -

Three-toothed cinquefoil

SAXIFRAGACEAE - Saxifrage Family

*Heuchera richardsonii* R.Br - Alumroot

*Saxifraga tricuspidata* Rottb. - Three-toothed saxifrage

VIOLACEAE - Violet Family

*Viola canadensis* L. - Western Canada violet

**HYDROPHYLLACEAE** - Waterleaf Family

*Phacelia franklinii* (R.Br.) Gray - Franklin's scorpionweed

NYMPHAEACEAE - Water-lily Family

*Nuphar lutea* (L.) Sm. - Yellow pond lily

LENTIBULARIACEAE - Bladderwort Family

*Utricularia vulgaris* L. - Greater bladderwort

HALORAGACEAE - Water-milfoil Family

*Myriophyllum spicatum* L. - Spiked water-milfoil

PYROLACEAE - Wintergreen Family

*Moneses uniflora* (L.) Gray - One-flowered wintergreen

*Orthilia secunda* (L.) House - One-sided wintergreen

*Pyrola asarifolia* Michx. - Pink wintergreen

*Pyrola chlorantha* Sw. - Greenish-flowered wintergreen

CAPRIFOLIACEAE - Honeysuckle Family

*Linnaea borealis* L. - Twinflower

ASTERACEAE - Aster Family

*Achillea millefolium* L. - Woolly yarrow

*Antennaria parvifolia* Nutt. - Small-leaved pussytoes

*Leucanthemum vulgare* Lam. - Ox-eye daisy

*Matricaria discoidea* DC. - Pineappleweed

*Petasites frigidus* (L.) Fr. - Palmate-leaved colt's-foot

*Senecio pauperculus* Michx. - Balsam

groundsel

*Solidago spathulata* DC. - Mountain goldenrod

**GRAMINOIDS - Grasses and Grass-like Plants**

POACEAE - Grass Family

*Alopecurus aequalis* Sobol. - Short-awned foxtail

*Calamagrostis canadensis* (Michx.) Beauv. - Marsh reed grass

*Oryzopsis pungens* (Torr.) Hitchc. - Northern rice grass

*Poa glauca* Vahl - Glaucous blue grass

*Poa nemoralis* L. - Wood blue grass

CYPERACEAE - Sedge Family

*Carex aquatilis* Wahl. - Water sedge

*Carex atherodes* Spreng. - Awned sedge

*Carex brevior* (Dewey) Mack. - Sedge

*Carex buxbaumii* Wahl. - Brown sedge

*Carex canescens* L. - Short sedge

*Carex deflexa* Hornem. - Bent sedge

*Carex disperma* Dewey - Two-seeded sedge

*Carex leptalea* Wahl. - Bristle-stalked sedge

*Eriophorum brachyantherum* Trautv. - Close-sheathed cotton-grass

JUNCACEAE - Rush Family

*Juncus balticus* Willd. - Baltic rush

*Juncus longistylis* Torn - Long-styled rush

**BRYOPHYTA - Non-vascular Plants (Mosses & Liverworts)**

MOSSES

*Ceratodon* spp. \*

*Dicranum* spp. \*

*Hylocomium* spp.

*Pleurozium schreberi*

*Polytrichum* spp.

*Ptilium* spp. \*

*Pylaisiella* spp. \*

*Sphagnum* spp. \*



## LIVERWORTS

*Ptilidium* spp. \*

## MYCETEAE - FUNGI KINGDOM

## LICHENS

*Actinogyra muhlenbergii*

*Bryoria* spp.

*Cetraria* spp.

*Cladina mites*

*Cladina stellaris*

*Cladonia amaurocrea*

*Cladonia gracilis*

*Cladonia coccifera*

*Flavocetraria* spp.

*Hypnogymania* spp.

*Nephroma bellum*

*Parmelia* spp. \*

*Peltigera canina*

*Stereocaulon tomentosum*

*Umbilicaria deusta*

*Usnea* spp. \*

*Xanthoparmelia taractica*

\* = No voucher specimen collected

Bold = plants are rare according to the  
Saskatchewan Conservation Data  
Center.

## Acknowledgements

Thanks are extended to Dr. Vernon Harms for assisting with verification of the vascular plant specimens. Dr. John Sheard graciously agreed to identify the lichen species collected. Rick Kolstad and Debbie Peters of Forest House Lodge acted as tour guides and hosts during my visit.

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**Tiger Salamander**

**George Tosh**



# NEED FOR PRESERVATION OF THE GULL LAKE WETLANDS, MANITOBA

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In June 1998, Native Orchid Conservation Inc. applied for, and received, a grant from Manitoba Hydro to make a botanical survey of the Gull Lake wetlands, to be completed in the year 2000. Our recently completed interim report contains all the information compiled to date concerning the native flora of this wetlands, together with recommendations for their ongoing management. Because the findings thus far are so interesting, we decided to publish this summary of the interim results and recommendations. (The original report to Manitoba Hydro with a complete list of all plant species is available from Native Orchid Conservation Inc.)

The Gull Lake Wetlands, 50° 25' North, 96° 31' West, near the southeast corner of Lake Winnipeg, Manitoba, is immediately north of the Brokenhead First Nations Reserve. A very unusual area, it was formerly known as the Scanterbury Bog. Scanterbury was a tiny siding on the railroad between East Selkirk and Beaconsfield (where the railroad turns east to Stead and then north to Pine Falls). The southern portion of the fens was bisected by Highway 59; the main remaining fens are just west of Highway 59, north of its junction with secondary highway 219 to Stead. Dr. Karen Johnson, curator of Botany at the Museum of Man and Nature has said that these fens have more rare and unusual plants including rare orchids and carnivorous plants than any other known site in Manitoba.

The Gull Lake Wetlands is a topographically confined raised bog,

with some central ponds and marginal wet troughs (flarks) and a marginal fen. Section 34, Township 26, Range 7, comprises the biggest part of the fen and is the most interesting from a botanical perspective. A fen is a kind of peatland characterized by a high water table, but with slow internal drainage by seepage down very gradual slopes. The slow moving ground water is enriched by nutrients from upslope materials and thus fens are more mineral rich and less acidic than bogs. The pH of the groundwater in this fen is approximately 7.0 to 7.5. The vegetation has a high proportion of sedges along with many other rare and interesting plants.

Once there were hundreds of ponds but now, since the construction of Highway 59 through the area, only about 15% of the ponds have water in them. Some of the feeding streams were cut off but ten different ones are still active; two of them still keep some of the ponds supplied with water. Also, use of a well in the nearby gravel pit may have damaged some of these streams by drawing down the water table. There are two locations with indications that streams were once present, with one of them actually having water coming out of it at present. A more thorough investigation still needs to be done of the mechanisms that keep this fen supplied with water.

I have collected 255 plant species in the wetlands to date, including 28 species of native orchids, with two new species found this year. One is the Moccasin Flower, and the other is the



Rose Pogonia which is considered rare in Manitoba. As well, eight species of carnivorous plants, including the rare Oblong-leaved Sundew, Horned Bladderwort, and Linear-leaved Sundew occur there. Twenty-four species of rare plants have been discovered in this fen, thus far. One of these, the Bog Adder's Mouth Orchid, is rare in Canada (See following lists.)

### Provincially And Nationally Rare Vascular Plants

<i>Arethusa bulbosa</i> L.	Dragon's Mouth
<i>Calopogon tuberosus</i> (L.) BSP var <i>tuberosus</i>	Grass Pink
<i>Carex capillaris</i> L.	Hair-like Sedge
<i>Carex gracillima</i> Schw.	Slender Sedge
<i>Carex sterilis</i> Willd.	Dioecious Sedge
<i>Ceanothus herbaceus</i> Raf.	New Jersey Tea
<i>Chara</i> spp.	Stonewort (a kind of algae)
<i>Cladium mariscoides</i> (Muhl.) Torr.	Twig Rush
<i>Cypripedium arietinum</i> R. Brown	Ram's Head Lady's-Slipper
<i>Drosera anglica</i> Huds.	Oblong-leaved Sundew
<i>Drosera linearis</i> Goldie	Slender-leaved Sundew
<i>Goodyera tessellata</i> Lodd.	Tesselated Rattlesnake Plantain
<i>Malaxis monophylla</i> L. var <i>brachypoda</i>	White Adder's-Mouth
<i>Malaxis paludosa</i> (L.) Sw.	Bog Adder's-Mouth *
<i>Malaxis unifolia</i> Michx	Green Adder's-Mouth
<i>Platanthera hookeri</i> (Torr.) Lindl.	Hooker's Orchid
<i>Pogonia ophioglossoides</i> (L.) Ker	Rose Pogonia
<i>Potentilla gracilis</i> Dougl.	Graceful Cinquefoil
<i>Primula egaliksensis</i> Wormsk.	Greenland Primrose
<i>Pyrola rotundifolia</i> L.	Common Wintergreen
<i>Rhynchospora alba</i> (L.) Vahl	White Beak Rush
<i>Rhynchospora capillacea</i> Torr.	Slender Beak Rush
<i>Solidago uliginosa</i> Nutt. (S.Purshii Porter)	Bog Goldenrod
<i>Utricularia cornuta</i> Michx.	Horned Bladderwort
* rare in Canada	

### Index Of Gull Lake Orchid Species

<i>Amerorchis rotundifolia</i> (Pursh) Huttén	Small Round-leaved Orchid
<i>Arethusa bulbosa</i> L.	Dragon's mouth
<i>Calopogon tuberosus</i> (L.) BSP. var. <i>tuberosus</i>	Grass Pink
<i>Calypso bulbosa</i> (L.) Oakes var. <i>americana</i> (R.Brown)	Luer Fairy or Venus Slipper
<i>Coeloglossum viride</i> (L.) Hartmann	Long-bracted Orchid
<i>Corallorhiza maculata</i> Raf.	Spotted Coralroot
<i>Corallorhiza striata</i> Lindl.	Striped Coralroot
<i>Corallorhiza trifida</i> Chat.	Northern or Early Coralroot
<i>Cypripedium acaule</i> Ait.	Moccasin Flower
<i>Cypripedium arietinum</i> R. Brown	Ram's Head Lady's-Slipper
<i>Cypripedium calceolus</i> L. var. <i>parviflorum</i> (Salisb.) Fern.	Small Yellow Lady's-Slipper
<i>Cypripedium calceolus</i> L. var. <i>pubescens</i> (Willd.) Correll	Large Yellow Lady's-Slipper
<i>Cypripedium reginae</i> (Walt)	Showy Lady's-Slipper
<i>Goodyera repens</i> (L.) R.Br. var. <i>ophiodes</i> Fern.	Lesser Rattlesnake Plantain



*Goodyera tessellata* Lodd.  
*Liparis loeselli* (L.) Richard  
*Listera cordata* (L.) R. Brown  
*Malaxis monophylla* L. var. *brachypoda*  
*Malaxis paludosa* (L.) Sw.  
*Malaxis unifolia* Michx.  
*Platanthera dilatata* (Pursh) Lindl. ex Beck  
*Platanthera hookeri* (Torr) Lindl.  
*Platanthera hyperborea* (L.) Lindl  
*Platanthera obtusata* (Pursh) Lindl(L) R. Br.  
*Platanthera orbiculata* Torr. Lindl  
*Pogonia ophioglossoides* (L>) Ker  
*Spiranthes lacera* Raf.  
*Spiranthes romanzoffiana* Cham.

Tesselated Rattlesnake Plantain  
Loesel's Twayblade  
Heart-leaved Twayblade  
White Adder's-mouth  
Bog Adder's-mouth  
Green Adder's-mouth  
Tall Leafy White Orchid  
Hooker's Orchid  
Tall Leafy Green Orchid  
Blunt-leaf Orchid  
Large Round-leaf Orchid  
Rose Pogonia  
Slender Ladies'-tresses  
Hooded Ladies'-tresses

**Recommendations**

Based on observations that we have made during this plant survey of this very special area, and in view of the very high concentration of rare plants, we recommend:

1. All plans to pump water from this bog to maintain water levels in the small, nearby resort lake, Gull Lake, of only 258 acres (105 ha), but with 300 summer cottage lots and 26 permanent residents, would further disturb the hydrology and would almost certainly have a negative effect on the rare native flora. Any such plans should be shelved until a detailed plant survey is completed.
2. Following this, any decisions about the area's future should be made only after consulting people who have extensive experience working with wetland ecosystems. The Brokenhead First Nation, because of their close proximity and traditional use of the area, should also be consulted regarding any future development plans.
3. Consideration should be given to having the fens set aside as a special park where further field studies could be done, the plants protected, and a

method of controlled access be set up. This rare and beautiful ecosystem should be preserved for future generations to enjoy.

**Acknowledgements**

I would like to thank everyone who helped me with this survey and the completion of this report. Special thanks to Dr.Karen Johnson, Laura Reeves, Gloria Keleher and Gerry Oliver for their generosity in lending their professional expertise to this project. I am grateful to Dr. Johnson for her comments and suggestions. Dr. Vernon L. Harms provided constructive criticism. Any errors in this report are strictly the responsibility of the author.

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# REPTILES AND AMPHIBIANS

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## THE RANA (RESEARCHING AMPHIBIAN NUMBERS IN ALBERTA) PROJECT

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### Introduction

Declines in amphibian populations are occurring around the world, but some regions, and some species are experiencing more dramatic declines than others. There is no clear pattern yet as to which species are subject to declines and which are not. A great deal more work needs to be done in order to fill gaps in our knowledge in respect to the geography of amphibians, and where declines are occurring. Little information is available on population fluctuations and/or distributional changes for many species of amphibians (Pechmann and Wilbur 1994).<sup>3</sup>

In Alberta, little work had been conducted on amphibians, and no long-term standardized data have been collected. The RANA (Researching Amphibian Numbers in Alberta) project began in 1997. This monitoring program combines intensive monitoring with public education.

The objectives of the program for 1998-99 were:

To institute intensive, standardized monitoring programs at five representative breeding sites in the province of Alberta.

To use these sites as tools to educate the public about the amphibians of Alberta and how studies are conducted.

### Methods

#### Study Sites

Five sites were surveyed in 1998: Beaverhill Lake, Cypress Hills, Kananaskis, Lesser Slave Lake, and Meanook (Figure 1, Table 1). Beaverhill, Lesser Slave, and Meanook had been surveyed in the summer of 1997. Sites were chosen based on three criteria: 1) must be representative of an ecoregion and encompass a variety of breeding amphibian species, 2) must be close to a park or protected area where the public visit, and 3) must be amenable to having pitfall traps placed around the site.



*Table 1: Latitude, Longitude, and Ecoregion of the five study sites in 1998.*

Study Site	Ecoregion	Latitude	Longitude	Pond Circumference
Beaverhill Lake	Aspen Parkland	53.38°	112.53°	9 – 10 m arrays
Cypress Hills	Montane/Prairie	49.66°	110.06°	140 m
Kananaskis	Montane	50.95°	115.14°	90 m
Lesser Slave Lake	Boreal Forest	55.35°	114.74°	250 m
Meanook	Boreal Forest	54.62°	113.35°	240 m

*Figure 1: Map of 1998 RANA site locations in Alberta.*

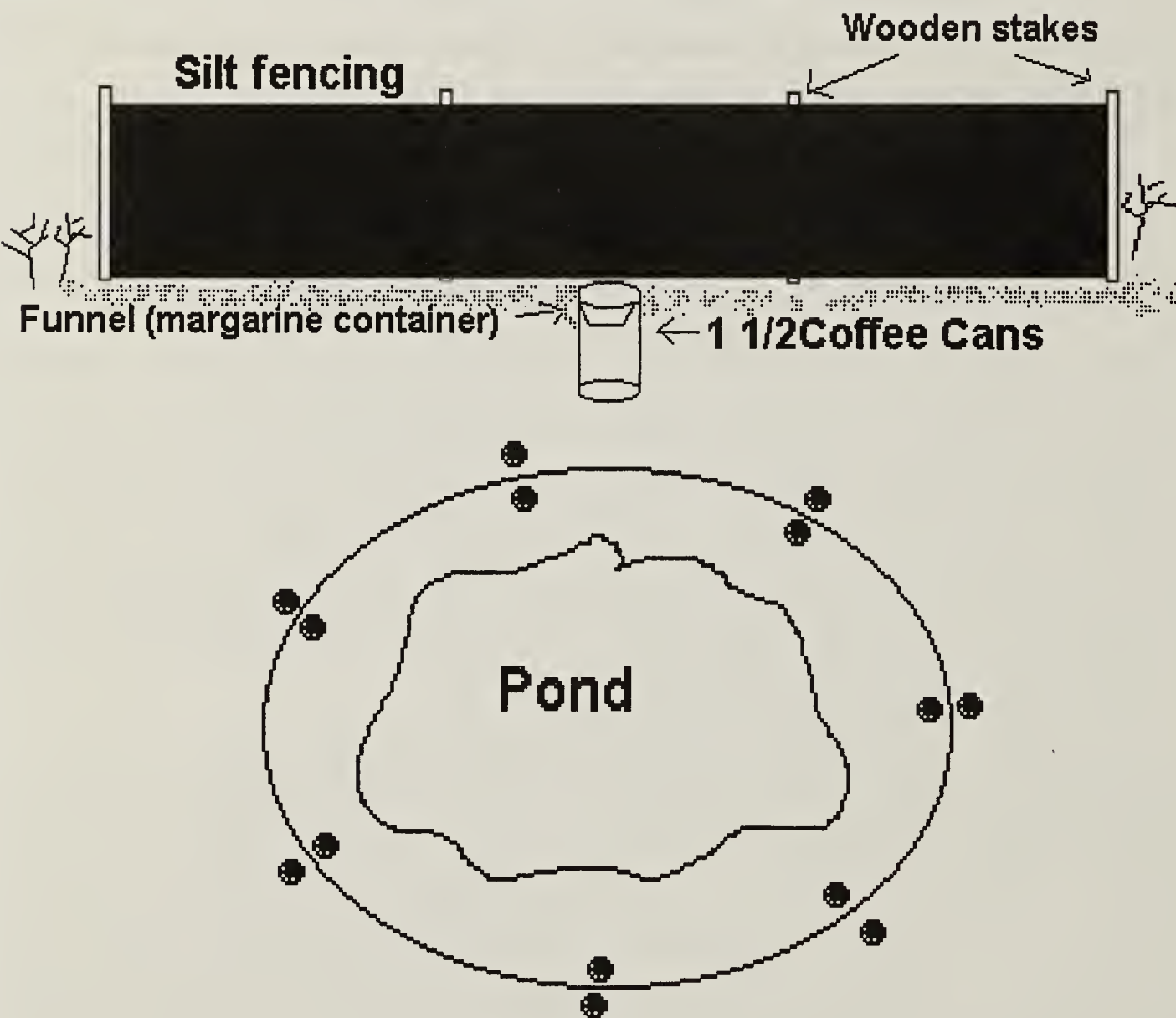




Drift fences are commonly used to inventory amphibian communities.<sup>2</sup> A variety of fence materials have been used including plastic, aluminum, galvanized hardware cloth or silt fencing.<sup>1</sup> Each new monitoring pond site was surrounded by a silt fencing and pitfall traps (1 ½ coffee cans deep) to allow capture of animals moving toward or away from the site. Beaverhill had the plastic fencing

replaced with silt fencing, as it was heavily damaged by coyotes and beavers, while Lesser Slave and Meanook simply had the plastic fencing repaired. Fencing completely surrounded each pond, and pairs of pitfall traps were placed every 10 m along each side of this fence (Figure 2). At Beaverhill nine arrays of fencing (10 m each) were set in three habitat types along a small lake.

**Figure 2: Diagram showing fencing and pitfall trap set-up.**



Beaverhill, Lesser Slave, and Kananaskis were surveyed for three consecutive weeks in the spring, intermittently in the summer, and three consecutive weeks later in July and August. Cypress Hills and Meanook were only surveyed in July and August. When sites were not in operation, plastic tops were placed on top of the

coffee cans and the fencing was opened up to allow amphibians to move freely to and from the pond.

**Results**

In 1998, over 1 200 amphibians were captured at the five sites, representing eight species:



- Long-toed Salamander (*Ambystoma macrodactylum*)
- Columbia Spotted Frog (*Rana luteiventris*)
- Tiger Salamander (*Ambystoma tigrinum*)
- Northern Leopard Frog (*Rana pipiens*)
- Boreal Chorus Frog (*Pseudacris maculata*)
- Boreal Toad (*Bufo boreas*)
- Wood Frog (*Rana sylvatica*)
- Canadian Toad (*Bufo hemiophrys*)

Wood frogs and boreal chorus frogs were the most common species while the Canadian toad was the least common amphibian captured (Table 2). Captures varied in different ecoregions. Wood frogs were caught at every site but Cypress Hills. Spotted frogs and long-toed salamanders were only captured at Kananaskis. No great plains toads or plains spadefoots were caught at any of the sites. More tiger salamanders were captured at Beaverhill in 1997 than in 1998. Boreal toad captures at Meanook and Lesser Slave Lake were much higher in 1998, while wood frog captures dropped at Meanook (Table 3).

**Table 2: Numbers of each species captured at RANA sites in 1998.**

Study Site	LTSA	TISA	BCFR	WOFR	CSFR	NLFR	BOTO	CATO	TOTAL
Beaverhill Lake	0	1	17	182	0	0	0	0	200
Cypress Hills	0	31	2	0	0	5	0	0	38
Kananaskis	186	0	0	61	7	0	33	0	287
Lesser Slave Lake	0	0	5	33	0	0	23	1	62
Meanook	0	0	4	277	0	0	343	0	624
TOTAL	186	32	28	553	7	5	399	1	1 211

**Table 3: Numbers of each species captured at RANA sites in 1997.**

Study Site	TISA	BCFR	WOFR	BOTO	CATO	TOTAL
Beaverhill Lake	21	0	0	0	0	21
Lesser Slave Lake	0	10	73	7	0	90
Meanook	0	4	193	3	0	200
TOTAL	21	14	266	10	0	311

**Public Education**

1265 people visited RANA sites in 1998 (Table 4), compared to 386 in 1997. Lesser Slave Lake, Beaverhill, and Meanook more than doubled the number of people visiting the sites.



Table 4: Number of visitors to each RANA site

Location	Number of People	
	1997	1998
Beaverhill Lake	50	125
Cypress Hills	-	150
Kananaskis	-	359
Lesser Slave Lake	326	611
Meanook	10	20
TOTAL	386	1 265

Acknowledgements

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I would also like to acknowledge the RANA field coordinators for their hard work: Beaverhill Lake – Christine Rice, Shannon Quinn, Lisa Burt, Cypress Hills – Jon Hornung, Kananaskis – Jennifer Dober, Lesser Slave Lake – Andrew Yeo, Meanook – Emma Crawford.

Research input and support was appreciated from the following individuals: Brian Eaton, Cindy Paszkowski, Steve Brechtel, Bruce Treichel, Kris Kendell, and Jeff Adamyk. Finally special thanks to all the volunteers that helped at each of the study sites.

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## OVERWINTERING SURVIVAL OF THE SEVEN-SPOT LADYBUG (*COCCINELLA SEPTEMPUNCTATA*) IN EDMONTON

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### Introduction

Ladybugs are beetles belonging to the family Coccinellidae, a family of over 5200 species worldwide.<sup>4</sup> They are represented by approximately 64 species in Alberta where they are widespread in a variety of habitats, from prairie sand dunes, to the alpine, to peatlands and marshes.<sup>1</sup> Not all are red or orange with black spots, and it is the larger and more colourful members of the family, in the tribe Coccinellini, that we generally think of when we think of “ladybugs. “Some entomologists prefer the common name “ladybird beetles” to “ladybug” since it is a more accurate term, but here in Alberta the use of “ladybug” is almost universal, so that is the name we prefer.

The purpose of this study was to experimentally examine the over winter survival of hibernating seven-spot ladybugs (*Coccinella septempunctata*), an introduced species native to Europe. This species has become abundant and widespread in North America over the past 40 or so years, but the reasons for this have not been well studied.

Ladybugs have historically been released to control pests in greenhouses, orchards and croplands.<sup>3</sup> *C. septempunctata*

was the most commonly released species in the 1950's and 1970's because of its ability to adapt to a variety of habitats and alternative food sources.<sup>3</sup> It is suspected that the seven-spot ladybug has spread on its own from its original points of introduction on the east coast of the United States, to eventually establish populations in a variety of habitats throughout Alberta. Gordon (1985) reported an isolated population in the southwester corner of Alberta, and since then there has been a noticeable increase in *C. septempunctata*'s numbers. Of the 2163 ladybugs identified in various regions of Alberta by the authors in 1995-1998 (but not counting those used in the following studies), 1855 (86%) were seven-spots. Simultaneously, some species native to Alberta (notably *Coccinella transversoguttata*, the transverse ladybug, and *C. novemnotata*, the nine-spot ladybug) have apparently become less common than they once were, but no studies of this major ecological change have been published. However, similar effects were documented in South Dakota, where the arrival of the seven-spot coincided with a reduction in the abundance of *C. transversoguttata*, and the two-spot ladybug, *Adalia bipunctata* (Elliot et al. 1996).<sup>2</sup> Thus, there is reason



to believe that the seven-spot has had a negative effect on the biodiversity of native ladybugs in Alberta, although the mechanism involved is unknown.

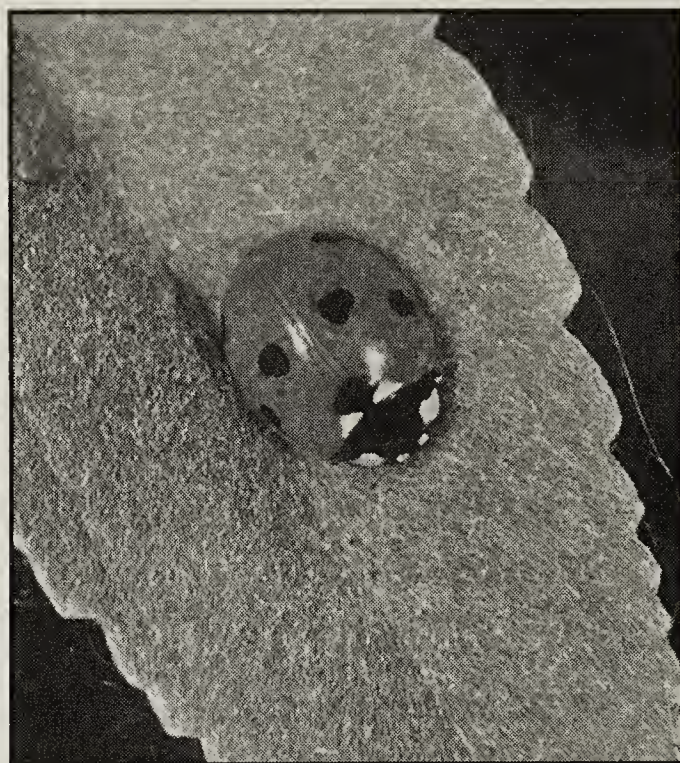
High overwinter survival may play a role in the Seven-spot's success in North America. In Great Britain, many species of coccinellids aggregate at overwintering sites in large numbers (Majerus, 1994), and we have observed this in Alberta as well. Survival of hibernating ladybugs is dependent on many factors, including 1) nutritional state before hibernation, 2) temperature and humidity during hibernation, 3) suitability of habitat, 4) diseases, and 5) predators. Ladybugs are affected by viral and fungal pathogens in Europe, where mortality caused by a pathogenic fungus (*Beauveria* sp.) is common.<sup>7</sup> Hibernating ladybugs may also be vulnerable to attack by ants, spiders, carabid ground beetles, mites, and nematodes.

## The Studies

### Observations of Naturally Hibernating Ladybugs

From October of 1996 to April 1997, seven-spot ladybugs were collected from a hibernation site at the Opal Natural Area, 10 km northeast of Opal, Alberta. The site is in a boreal mixed-wood forest, on stabilized sand dune soils, and the vegetation at the site is dominated by jack pine (*Pinus banksiana*) with a ground cover of reindeer lichen (*Cladonia mitis*). Nearby, aspen parkland vegetation, characterized by aspen poplar (*Populus tremuloides*), white spruce (*Picea glauca*) and prickly wild rose (*Rosa acicularis*) is abundant. As well, there is a marsh area adjacent to the reserve to the west.

Prior to hibernation, common predators at the site included ants and



***Seven-spot Ladybug (Coccinella septempunctata, Edm, AB.***

***John H. Acorn***

spiders. Potential ladybug prey, in the form of aphids and small dipteran flies, were abundant at the site, and ladybugs were observed eating both types of prey before hibernation. Although feeding does not occur during the winter months, it is important that ladybugs feed constantly prior to hibernating.<sup>7</sup>

Along with nutrition, appropriate moisture levels are important for overwintering survival—too much can cause drowning, too little can cause desiccation. During mid winter, the reindeer lichen was supple and moist under the snow, while in mid summer it is often dry and crumbling. Thus, the microhabitat gave the impression of having abundant but not excessive moisture. Reindeer lichen also continues to respire under the snow, possibly increasing oxygen levels and reducing the suitability of the site for *Beauveria* fungus, which thrives in anaerobic conditions.<sup>6</sup>

In April, only four ladybugs were found dead at the site. Of those, 2 were found on decayed leaf litter and soil, and both



showed signs of fungal growth. The other two were dissected, whereupon adult and larval mites were found internally. Unfortunately, these mite specimens were misplaced, and further identification was not possible. One adult mite was found within the abdominal wall of one of the seven-spots, and two larvae were found feeding among the ovaries of the other seven-spot. It is not possible to know if they killed the ladybugs or were attracted to the carcasses.

### **Experimental Overwintering of Seven-spot Ladybugs**

On October 15, 1996, over 150 seven-spot ladybugs were collected at the Opal Natural Area in less than 20 minutes, using an aspirator and a sweep net. They were then put into 10 cm x 10 cm x 13 cm wooden boxes with 10 cm x 10 cm pieces of screening stapled to the tops, preventing any escapes. The wood used for the boxes was 2 cm thick. Five boxes were lined with 18-19 grams of leaf litter (LL), and one was lined with 52 grams of reindeer lichen (DL). All of the boxes were stocked with 20 seven-spot ladybugs except for one of the LL boxes, which received 50. On October 17 the boxes were placed into the ground in a suburban flower garden in Edmonton, such that the tops of the boxes were flush with the soil surface. The area was then covered with a thin layer of leaf litter and left until April 16, 1997. In January and February of 1997, thermistor probes attached to a Lakewood Systems model mL-16E Ultra-logger monitored daily maximum and minimum air temperature, soil surface temperature and temperature 5 cm below the soil surface where the ladybugs would be present.

On April 16, 1997, the ladybugs were taken out of the boxes and surviving individuals became active within five minutes of reaching room temperature.

These ladybugs were kept alive on liver cat food until outside conditions permitted their release. Dead ladybugs were dissected and observed under a stereo microscope for possible causes of mortality.

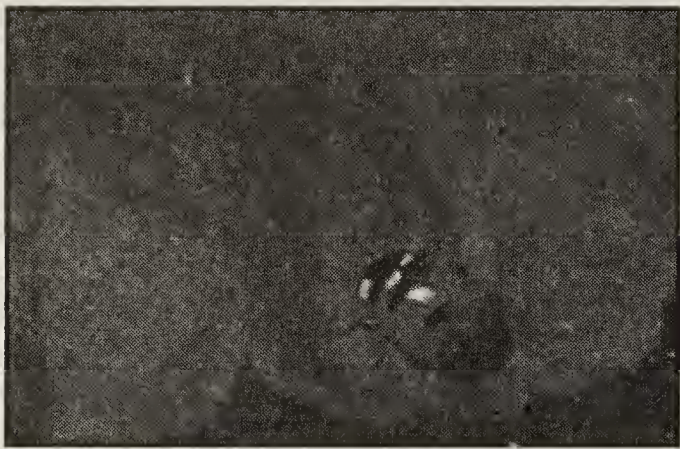
The survival rate of seven-spots at the experimental site was very high at 97%. Only 5 of the 152 ladybugs died, 4 of which showed signs of fungal infection. Fungal spores were easily observed on the exterior of the beetles, and there was a thickened cheesy mass internally, matching Hodek's (1973) description of *Beauveria*. This fungus is found naturally in soil and compost material. The fifth ladybug was desiccated internally, and the cause of its death is unknown. A metre-deep blanket of snow insulated the ladybugs from cold and desiccation in both locations. Although the temperature dropped to -30° C several times during January the temperature at the soil surface and just below the soil remained between 5° C to 9° C, as recorded by the data logger. Presumably, we witnessed nearly ideal conditions for overwintering, compared to the humid and wet winters of Great Britain, where 50% of ladybugs can be infected with *Beauveria*.<sup>7</sup>

### **Other Potential Reasons for the Seven-spots' Success**

During this study, a number of ladybugs were kept in small terraria for observation. Although these observations were not carefully quantified, they do point to a few areas where further research might prove fruitful.

Captive seven-spot and transverse ladybugs appeared to possess roughly equivalent fecundity, measured by the numbers of eggs they laid in a 24-hour period. Female seven-spots laid between 12-50 eggs, while female transverse ladybugs laid between 15-49 eggs.





***Transverse Ladybug (Coccinella transversoguttata) Edmonton, AB***

**John Acorn**

Adults of both species readily ate both their own eggs and those of the other species. While foraging, however, the seven-spots appeared much more active and aggressive, compared to the slow, passive transverse ladybugs. Whether any of these factors are important to the interactions between the two species remains to be demonstrated.

## Conclusions

In general, it seems that the seven-spot ladybug is very much at home here in Alberta. It enjoys much higher overwinter survival than in its British home land, and may also be a more active and aggressive beetle than its Canadian relatives as well. It has certainly come to dominate the ladybug fauna here, but the reasons for its success are still very poorly known.

## Acknowledgements

This study was completed by Shelley Ryan as part of the requirements for the Biological Sciences program at the Northern Alberta Institute of Technology. Robin Leech served as Shelley's project supervisor, while John Acorn acted as an informal advisor. Shelley was assisted in the field by Cody Hovind, Nicole Ryan, and Aaron Ryan. A review of the manuscript by Cedric Gillott substantially improved the quality of this

paper. Thanks are also due to Rod Feland, Larry Macdonald, Dwayne Dorland, the Edmonton Natural History Club, and the students of James Gibbons Elementary School. Final preparation of this report was completed by John Acorn, when family commitments prevented Shelley from doing so herself.

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# INTERNATIONAL BUTTERFLY COUNTS - SASKATCHEWAN'S CONTRIBUTION AND THE BIRD CONNECTION

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At age 98, the Audubon Society's Christmas Bird Count (CBC) has become the "world's largest citizen science program".<sup>2</sup> In 1997 49,000 birders conducted 1800 CBCs. By comparison, the 24-year-old North American butterfly survey has to be considered the anonymous kid on the block. In 1997 3052 butterfly enthusiasts carried out 327 counts. Why a comparison between winter bird and summer butterfly counts? Because the latter is modeled on the former to the extent that both are conducted within a 24-km-diameter circle and take place within a 24-hour period.

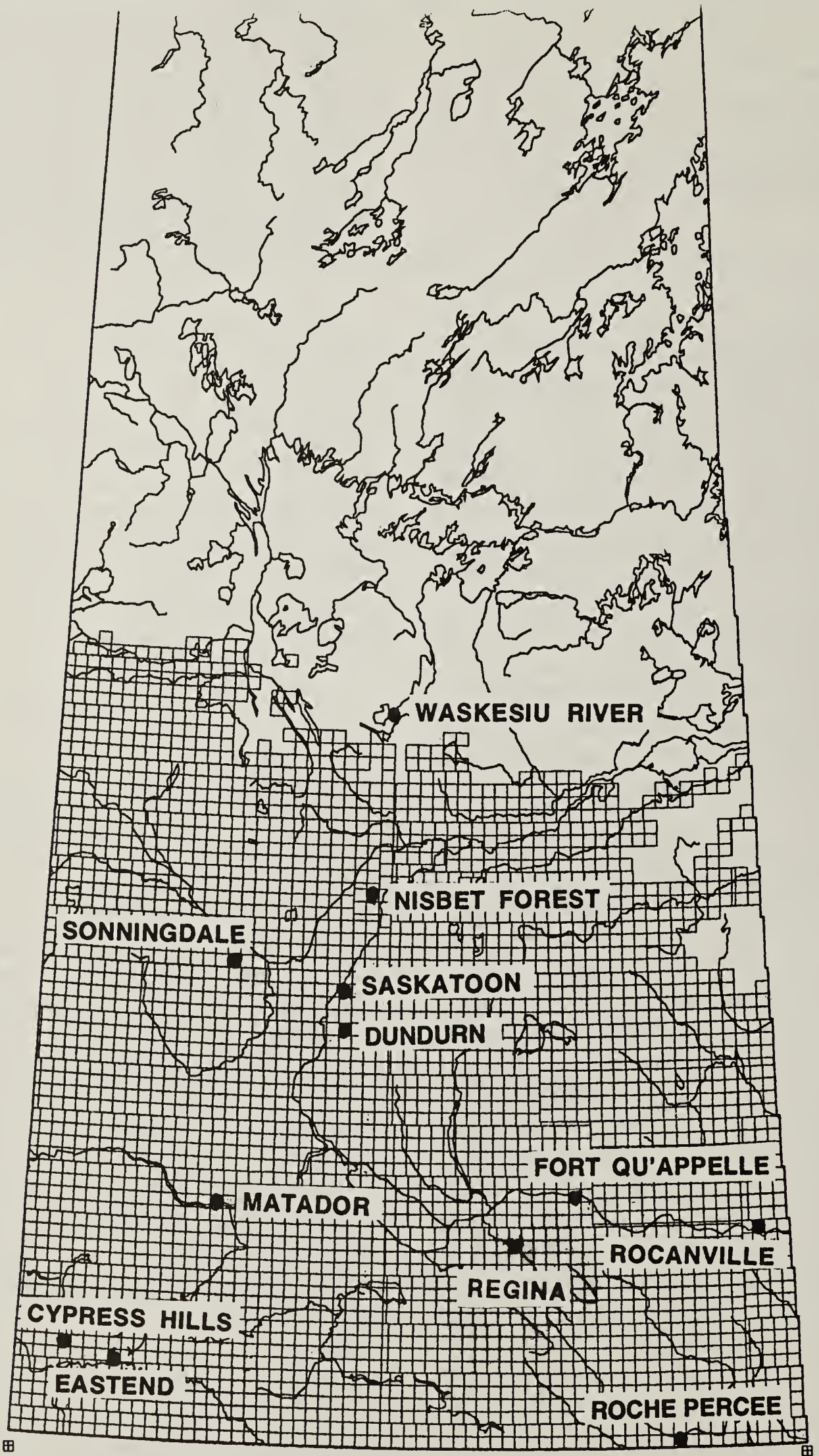
The North American Butterfly Association coordinates the annual survey known as the 4th of July Count (4JC). Because butterflies are frustratingly more sensitive to environmental conditions than birds and because numbers peak at significantly different times between Florida and Alaska, the rules are flexible: these surveys may be done within a month of July 4th. Actually, in the southern US some are done in May and those in Mexico are often carried out between September and January. The purpose of the counts is 1) to have fun; and 2) to determine a) what species are present; b) how their numbers change from year to year and over the long-term, and c) why the changes occur — due to natural or man-made causes, e.g., early/late seasons or habitat destruction.

Ken Pivnick brought 4JCs to Saskatchewan. He started a series of counts at Pike Lake in 1986. Ron Hooper began his counts in 1990 at Fort Qu'Appelle. Mike and Bernie Gollop organized their first 4JC in 1993 in the Dundurn PFRA Community Pasture and had expanded to ten counts by 1998. In 1997 11 of the 34 Canadian counts were in Saskatchewan — a total exceeded by only ten states and Ontario.

In 1997, the largest number of species on a 4JC was 154 in Mexico — equivalent to almost the entire complement of Saskatchewan's 157 butterflies. In the United States, the highest individual counts were 102 species in Arizona and 101 in Colorado. Windsor, Ontario, held the Canadian record — 50 species, as did Cypress Hills Provincial Park for Saskatchewan — 39. The Cypress Hills count was higher than 260 others north of Mexico, including some in California, Arizona, New Mexico, Texas and Louisiana. By comparison a team of birders can find about 100 species on a 1-day June count around Saskatoon — largely because more than twice as many species of birds (340±) have been found in southern Saskatchewan during our 4JC season.

In 1997 Saskatchewan 4JCs produced the highest North American counts for 11 species: Common Checkered Skipper: 81 at Matador (tied with a California count); Canadian Tiger









***Plains Skipper, August 18, 1998***  
***Bernie Gollop***

Swallowtail: 125 at Sonningdale (a new continental high); Western White: 52 at Matador; Olympia Marble: 1 at Dundurn (the only North American record); Giant Sulphur: 10 at Cypress Hills (only N.A. record); Western Tailed Blue: 59 at Sonningdale; Zerene Fritillary: 46 at Cypress Hills; Arctic Fritillary: 104 at Nisbet Forest (only N.A. count); Sagebrush Checkerspot: 3 at Roche Percee (only N.A. record); Common Alpine: 101 at Cypress Hills; and Uhler's Arctic: 58 at Dundurn (new continental high).

In 1998 12 4JCs were conducted in the southern half of the province (south

of 54° 30') between 8 June and 31 July by 39 count-participants, actually 21 people - some taking part in more than one count (see map and table). The total number of species was 80, ranging from 14 at Regina to 45 in the Cypress Hills and averaging 25 per count. No species was seen on all 12 counts. One was found on 11 counts — White Admiral — and five on ten counts — Canadian Tiger Swallowtail, Clouded Sulphur, Melissa and Greenish blues, and Northern Crescent.

At the other end of the scale, eight 4JCs accounted for the 31 species found only once: Cypress Hills had 10 single-count species: 1 Afranius Duskywing, 1 Draco Skipper, 4 Margined and 1 Mustard white, 25 Large Marbles, 6 Pink-edged Sulphurs, 1 Western Pine Elfin, 7 Boisduval's Blues, 6 Zerene Fritillaries and 102 Variable Checkerspots; Waskesiu River had 7: 32 Dreamy Duskywings, 3 Old World Swallowtails, 32 Eastern Pine Elfins, 9 Spring Azures, 1 Frigga and 1 Freija Fritillary and 1 Gray Comma; Nisbet Forest had 5: 4 Dorcas Coppers, 11 Coral Hairstreaks, 10 Aphrodite, 12 Atlantis and 107 Arctic Fritillaries; Roche Percee had 3: 1 Delaware Skipper, 23 Sagebrush Checkerspots and 1 Eastern Comma; Fort Qu'Appelle had an Uncas Skipper and an Acmon Blue; Rocanville had 2 Striped Hairstreaks and 9 Little Wood-Satyr; Eastend had 2 Ruddy Coppers, and Matador had a Nevada Skipper. While many cases of uniqueness are due to a species' range, for some wide-ranging butterflies they are due to their flight periods, e.g., Coral Hairstreak, Aphrodite Fritillary and Gray Comma. Some occurrences or lack thereof are due to the luck of the day.

If these counts had been for birds, several species would have appeared on every one because some 91 breeding birds, all of which are with us





***Common Wood-Nymph, August 8, 1998***

***Bernie Gollop***

throughout the period, have ranges that include all 12 4JCs. However, on average, butterfly ranges in southern Saskatchewan are smaller than birds'. The 12 counts were completely within the distributions of only 39 species of butterflies of which, at most, 23 are normally flying through all of the 2-month period.

The total number of individuals was 5534, which works out to an average of 461 butterflies per count — about one fifth the number of birds for a one-day spring count by one team. The most commonly identified species were Clouded Sulphur (793), Northern Crescent (419), Common Wood-Nymph (285), Canadian Tiger Swallowtail (278) and Greenish Blue (231). Twelve species were represented on only one count (see above). Fewer Monarchs (below the normal number) came to Saskatchewan in 1998 — 2 were seen on these counts, compared to last year's above-average 21.

Partly because they do not identify themselves by song, proportionately

more butterflies than birds are difficult to identify to species in the field. As a result, some 4JCs have a significant number of identifications only to genus, subfamily and family. In 1998, these accounted for more than 1 butterfly in five (1207 individuals) of the butterflies seen. Over a third (460) of these were recorded as "Blues" — more than the 429 blues identified to 8 species. For the Ft. Qu'Appelle and Regina counts, only butterflies identified to species are reported.

As with similar bird surveys, the best available unit for comparing one area or year with another is probably animals per party-hour. Party-hour is a measure of the effort involved in searching, i.e., the number of hours that groups — whether of one or 5 or 20 butterflyers — spend separately looking for their quarry. On this basis, Cypress Hills Provincial Park was number one in Saskatchewan with 83 butterflies per party-hour, down from 107 in 1997. It was followed by Roche Percee with 65 in 1998, up from 42. The lowest numbers were 13 at Dundurn (55 in 1997) and 18 at Ft.



Qu'Appelle (28). The reason for such variations is most often weather, either on count day or in the previous month or two — being favourable or unfavourable to butterfly development.

Because a species' flight period is so short, less than a month in some cases, things happen fast; hence the need for counts at the same time each year. Calendar date has to suffice because of the difficulty of assessing how much earlier or later one year is than another. From 1995 through 1998, Saskatoon 4JCs were held on 12, 14, 12 and 11 July. In 1996 Common Wood-Nymphs were particularly late. The comparison with other years is based, in part, on an almost daily count of butterflies on the Central Avenue Prairie in Saskatoon in 1994 when the period between first appearance and the peak number of wood-nymphs (147 in 1 hour) was 2 weeks.<sup>1</sup> It would appear that 1995, 1997 and 1998 were similar in relation to wood-nymph development around Saskatoon and about 11 days earlier than 1996.

During these 4JCs, copulating pairs of butterflies were also recorded: 2 pairs each of Clouded Sulphur at Saskatoon, Silvery Blue at Eastend and Great Spangled Fritillary at Roche Percee.

The 1998 participants were: Mike and Bernie Gollop for Dundurn, Matador, Rocanville, Roche Percee and Sonningdale; Mel Fitch and the Gollops at Cypress Hills and Eastend; Ross Layberry and the Gollops at Nisbet Forest; Keith Roney, Keith Barr, Jane Chapco, Bob and Sandy Ewart, Ron Hooper, Jeanette Pepper, Jim Rydzik and Glenn Sutter at Regina; Ron Hooper, Phyllis Bordass and Keith Stephens at Fort Qu'Appelle; Alex Fornal-Gollop, Lorriene, Craig, Andy and Rob Salisbury, Michael Williams and the Gollops at Saskatoon.

So, how does one count butterflies? A survey is best done between 8 am and 5 pm, because most butterflies fly from several hours after sunrise to the same period before sunset. Warm, sunny days with little wind will usually be most productive. At the extremes of our butterfly season — 13 March and 3 November — the Mourning Cloak is all alone but more than 80% of our species fly in parts of both June and July.

There may be three to ten stops within a count circle, each with one or more routes radiating from it. Walking the same trails each year, observers try to keep track of each butterfly seen and use their best judgment in counting an individual once and only once. The party-hour rates above show that this is not as impossible a feat as it might first seem. Two butterflies per minute is a high average;



***Western Tailed Blue pair, June 21, 1998  
Bernie Gollop***





***Variable Checkerspot, 16 June 97, Sucker Creek***

***Bernie Gollop***

some sites average only one in 3-4 minutes. Observations are recorded in a field book or on a form, along with information affecting the count: percent of sun, temperature and wind — morning and afternoon (because fewer butterflies fly on overcast, hot or cold or windy days). During a shower, the count shuts down. Binoculars, preferably focusing down to 2 m, are a big help.

So, if the birders who have read this article want to enhance their life style, butterflies are obviously the way to go. Field trips require none of the birder's early morning rising and freezing or binocularizing in the rain. The Audubon Society Handbook for Butterfly Watchers by Robert Pyle (1984. Scribner's, New York) outlines all the pleasures you can expect and how to attain them. The best book for identification is *The Butterflies of Canada* by Layberry, Hall and Lafontaine. (1998. UT Press, Toronto. \$29.95). A checklist with flight periods, geographical distribution, seven local lists and other information will be

available from me, hopefully in May 1999 (free). You might also want a net (children's size is what I use) for closer, more leisurely, but careful examination of these fascinating, fragile, flying flowers.

My thanks to Anna Leighton, Mike Gollop and Mary Gilliland for editing various versions of this article.

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4TH OF JULY BUTTERFLY COUNTS — SASKATCHEWAN — 1998 — 80 SPECIES

DUNDURN	CYPRESS HILLS	EASTEND	FORT QU'APPELLE	MATADOR	NISBET FOREST	REGINA		ROCANVILLE	ROCHE PERCEE	SASKATOON	SONNINGDALE	WASKESIU RIVER	TOTAL
10-Jun 21	23-Jun 45	24-Jun 26	25-Jun 27	22-Jun 20	31-Jul 23	23-Jun 14	Date Species	1-Jul 22	28-Jul 22	11-Jul 32	18-Jun 21	8-Jun 21	12 4JCs 80
12.9	15.1	13.6	7	11.3	12.3	7	Party-hours	9.1	13.3	19.6	12.1	6	139.3
16	24	31	10	20	22		Party-km on foot	17	8.6	34	20	12	214.6
0910-	0900-	0830-	0900-	0900-	0925-	0900-	Time-	0945-	0820-	0820-	0945-	1040-	0820-
1630	1630	1600	1600	1610	1520	1600		1620	1550	1550	1700	1655	1720
90/90	40/70	50/90	100/90	100/70	100/100	45/40	% Sunshine am/pm	100/100	50/40	90/100	50/80	40/10	
17-26	16-21	17-25	18-26	22-24	22-28	19-25	Temperature °C	23-27	23-27	20-29	16-19	8-21	
6-14	10-19	19-35	5-9	32-40	6-13	17-25	Wind kph	8-16	8-16	13-27	6-19	6-12	
163	1246	493	125	311	629	192	Individuals	325	866	593	376	215	5534
13	83	36	18	28	51	27	Butterflies per party-hour	36	65	30	31	36	40
	1		1	1			Silver-spotted Northern	2	2	2	13	13	7
	6	4		4			Skipper Cloudywing Duskywing*					29	38
	1						Dreamy Duskywing					32	32
	6						Afranius Duskywing					1	1
1		10	2	32			Persius Duskywing					1	7
							Common Checkered Skipper		3				47
1	2	42	11	88		39	Arctic Skipper	5		4		13	14
	12	1	1	2			Orange Skipper						9
							Garita Skipperling			4			187
							Uncas Skipper				1		1
							Hesperia Skipper				1		16
	1			1			Nevada Skipper			3			1
	1						Peck's Skipper						4
							Draco Skipper						1
	2		2				Tawny-edged Skipper	1		11			12
							Long Dash Skipper	2	1	2	7		15
							Delaware Skipper						1
			3				Hobomok Skipper		7	2	1	1	4
2	1	1	1	1	6		Dun Skipper	2				25	18
							Common Roadside Skipper						31
							Dark (Black) Swallowtail				1		1
24	133	8	4	1		3	Old World Swallowtail	3		1	93	3	3
1	6	25		1	8		Canadian Tiger Swallowtail	1	14	11		8	67
5	6	104		46	7		White		8	2	3		181
	4						Western Margined White						4
1	1	3	4	24	2	5	Mustard White	1	19	60			1
	25						Cabbage White						119
							Large Marble						25



DUNDURN	CYPRESS HILLS 23nJun	EASTEND 24nJun	FORT QU'APPELLE 25nJun	MATADOR 20nJun	NISBET FOREST 31nJul	REGINA	Date	ROCANVILLE 1nJul	ROCHE PERCEE 28nJul	SASKATOON 11nJul	SONNINGDALE 18nJun	WASKESIU RIVER 8nJun	TOTAL
10nJun	27 9	13 2	4 2		72	10	Clouded Orange	1	525 1	152/2cp**	3 4		45 793 3
	1 6	2	1				Christina Pink-edged Ruddy				2		4 6 2
	1		1	2	4 1 11		Dorcas Purple Coral						4 5 11
	1						Striped Eastern Pine Western Pine	2				32	2 32 1
12	261	98		7	1 1		Tailed Blue/Azure	5	2	8	59	6	459 1
3	25	6	2				Western Tailed-Blue	3		2	17	12	70
4	3	7 (2cp)	3			7	Spring Azure					9	9
3	3	12	5	18	1	5	Silvery Blue		4	4	19	5	52
26	115 7	32	3	9		3	Melissa Blue	7		1	2		54
							Greenish Blue			4	30	2	231
							Boisduvall's Blue						7
							Acmon Blue						1
2	1 85 1	1 64 1		18	105		Arctic Large	30	27 1	1	17		5 364 5
		2		2	40 10		Variegated Great Spangled	1 4	16/2cp	52			116 10 6
	6						Aphrodite Zerene						
	4	6	9	19	12 5	1	Callippe Atlantis	2	2	2			44 12 35
	2	2	5				Northwestern	7	1	10	2		
3	8 9			4	39 35		Mormon Small			6 6			12 57 41
	69				8		Silver-bordered			5	6		
							Meadow Frigga					1	88 1
							Freija					1	1
2	1				107		Arctic Gorgone			1			107 4
1	34 4	3	3		27		Sagebrush		23				23
4	12		38	1	36	7	Pearl Northern	26 187	37 4 4	20 1 84	13 45	3 8	138 45 419
	1 102 6		6		1		Tawny Variable	2	1			3	9 102 11



DUNDURN	CYPRESS HILLS 23nJun	EASTEND 24nJun	FORT QU'APPELLE 25nJun	MATADOR 20nJun	NISBET FOREST 31nJul	REGINA	Date	ROCANVILLE 1nJul	ROCHE PERCEE 28nJul	SASKATOON 11nJul	SONNINGDALE 18nJun	WASKESIU RIVER 8nJun	TOTAL
10nJun	1 1				2		Eastern Satyr Green Comma Comma Comma		1	2			1 3 6
3	9		1		2 1		Gray Compton Mourning Tortoiseshell Cloak	1	2	12 14	2	1	1 14 34
1	25 12 3	1 4 4		5		10 5 45	Milbert's Painted Red Admiral	1 4		2 2	8		52 21 66
1	1	14	1	1	1 1	1	White Northern Little Admiral Pearly-Eye Wood-Satyr	6 10 9	4 4	30	20	1	80 15 9
39	14	20	5	23	83	51	Common Common Common Ringlet Wood-Nymph Alpine		152	50	4		156 285 172
2	164						Wood-Nymph/Alpine Uhler's Arctic Monarch				4	2	1 7 2
6		1		1					1	1			

\* Group names are in italics

\*\* cp: No. of copulating pairs



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# HABITAT AND MANAGEMENT

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## WILDERNESS ETHICS AND ECOTOURISM - A WOLF'S VIEW

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This past summer, during the annual ecology immersion camp I guide into the Athabasca Sand Dunes, we lucked into an opportunity to observe a litter of five half-grown wolves near their den. For more than an hour we watched from our bellies on a soft dune among scattered hairgrass and willow sprouts as the pups sun-lounged, groomed, and romped in a small blowout below. One of them, perhaps on a daily, leisurely exploration of the den site perimeter, unwittingly angled up the dune towards us. At less than three paces distant it abruptly stopped, cocked its head sideways, and struggled to settle this strangely unfamiliar scene into some recognizable focus. Ecotourists! A whole flock of them!

In so far as a person's ethics consists of the internalized values and philosophy that shape her or his behaviour, wilderness ethics is concerned with one's interaction with nature. To maintain a healthy relationship with Nature "requires us to practice ethical constraint upon ourselves rather than unbounded pursuit of self-serving goals."<sup>1</sup> A healthy wilderness ethic promotes zero-impact camping and hiking, and therefore should be of primary interest to hikers, campers, and ecotourists generally.

In this brief moment of gazing into each other's eyes, and then as we watched the curious pup slither away,

tossing backward glances over one shoulder and the other, I felt a new awareness stirring. If values are what is treasured, aspired to, and defended I dare say wolves have values too. One might reasonably speculate they value privacy; safety; group allegiance and cooperation; experience and knowledge of territory; a pond-rich landscape rife with moose, beaver, deer, hares and grouse; soft, strong earth for dens; clean water; zero competition (as from coyotes, foxes, lynx); and zero harassment from trappers and hunters. Each species uses its values to determine how it should interact with the components that make up its perceived environment - it evaluates (sorts) these into degrees of good-bad-indifferent.

Although some of these wolf values may support those we humans elevate to song and worship, others may compete. Values underlying the behaviour of say a downy woodpecker are supportive of human values - after all, they feed on ants and other "destructive" insect larvae. Wolves, unfortunately, are near the bottom of our scale. Too many humans still consider them as nothing more than cattle-killing vermin to be eradicated.

Through further reflection on this wolf encounter, I have become increasingly aware of how important it is to see ecotourism as not merely about good experiences for ecotourists. It is equally



about good experiences for the landscape and wildlife that participate in the moment. In fact, to be successful and sustainable, ecotourism must be perceived as essentially a partnership between ecotourist and nature.

Ecosystems contain many examples of this sort of partnership arrangement; ecologists call it mutualism. The underlying understanding between the partners is, "As long as you continue to scratch my back, I'll keep scratching yours." Or, in an example, say of magpie and bison, "As long as you remove the occasional bug from my hide I'll let you perch on me to find them." Both parties benefit.

There is, however, one subtle (but critically important!) difference. In the case of ecotourists, our mutual understanding should not be with a single species or a select few species but with nature in its entirety - the entire ecosphere. Perched as we are at the top of the food and technology chain, we humans are challenged under the banner of "sustainable development" to rise above mere parsimonious evaluation and recognize first the fundamental goodness of the whole.

The underlying attitude that allows this mutual understanding to succeed indefinitely is complete and unwavering respect for nature. The ecosphere is so immense, so complicated, so fascinating that it deserves our respect. In Aldo Leopold's words "It is inconceivable to me that an ethical relation to the land can exist without love, respect, and admiration for the land."<sup>2</sup> Learning helps us develop this respect and so strengthen the partnership. Whether we are ecotourists or other wilderness visitors, by looking, listening, and actively exploring, Nature offers us moments of intense learning and personal growth. Her expectation

is that, in return, we will not merely maintain ongoing respect but become proactive in defending her against threats to her integrity and diversity. Our learning and consequent understanding empowers us to defend Nature and so strengthen our partnership with her.

Responsible ecotourism challenges us to embrace the following general guidelines:

- strive for zero impact on landscape and wildlife
  - encourage other wilderness users to strive for zero-impact, and teach them how
  - take nothing from the wilderness except the garbage we bring in, our memories, our learning, and our experience of personal growth
  - undertake, facilitate, model, and encourage maximum learning.
- More specifically, the following are some down-to-earth ways in which we can exercise our respect for nature and thus become better ecotourists and wilderness visitors (adapted from D.N. Cole<sup>3</sup>)
- plan your trips with small groups, not large
  - buy and store your food and drinks with an eye to minimizing leftover packaging
  - avoid off-trail travel if man-made trails already exist
  - be quiet, passive, and receptive instead of loud and aggressive
  - do not harass, follow or disturb resident wildlife
  - wear soft-soled shoes whose heels and toes are less likely to scoop holes into the soil
  - if permitted at all, feed on berries or other naturally growing foods only sparsely
  - in remote locations try to camp where you will cause least impact; acknowledge resident wildlife and your intention to share their home respectfully



- camp in natural openings to avoid cutting herbs, shrubs or any other vegetation
- do your bathing, wash your dishes, and dispose of waste water well away from water bodies
- if formal toilets are unavailable, deposit human waste in a 25 cm deep cathole (covered over) where it will decay as quickly as possible
- avoid using wood fires (use a camp stove); do not use fires to dispose of garbage or food
- if a fire cannot be avoided, use only existing deadfall
- if a fire is used, be sure to burn it down to ashes, soak the ashes with water, and disperse them so the fire-site can return to a natural state as early as possible
- do not leave behind bottles, cans, packaging or any other garbage
- do not bury garbage
- do not leave behind any human consumables or leave them at risk of being tasted or consumed by wildlife
- if you have space in your pack, take out garbage you may find left behind by other campers or hikers
- upon leaving, remove all evidence of your stay in a campsite; thank resident plants and animals for sharing the site with you
- avoid using motorized transportation
- hike, canoe, etc., in ways and at times that minimize impact on landscape and wildlife
- use only biodegradable soap and in small amounts.

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A force more powerful even than predators in moulding butterfly behaviour has been climate, and its daily expression, weather. The elements probably account for as much butterfly mortality as predators, parasites, and disease together.



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# NOTES AND LETTERS

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## BOBOLINKS AT PADDOCKWOOD

JOHN J. DINIUS, Box 27, Paddockwood, SK S0J 1Z0

On 30 June 1997, during inspection of our bluebird boxes, we reached the boxes on the Nadine Wilson pasture — section 11, township 53, range 25 w2 — land seeded to grass about four years ago. Here we spotted a bird we hadn't seen before in our area, a Bobolink. We saw a second a mile farther on.

Early on 1 July we returned on horseback to confirm the identification. At the second site a bird flew up and treated us to his beautiful bubbling song. The next day we returned and found three male bobolinks sitting on the fence beside the road. While I was taking photographs two smaller, slightly brownish grey female bobolinks appeared. Two handsome dudes immediately flew above them, and forced each female down into the grass.

Bobolinks have not been sighted previously near Paddockwood by any of our neighbours, although Maurice Mareschal has recorded them three times on his annual Clouston Breeding

Bird Survey; 1 in 1981 and 2 in 1983 between Clouston and Highway 2, and another 2 in 1983 near Davis, both only 50 km south of our observation. Other Saskatchewan Breeding Bird Survey sightings have been on the Edam, Brightsand and Turtleford routes (Muriel Carlson and Michael Williams). The nearest breeding records are those of a completed nest and later a flightless young bird by Maurice G. Street at Nipawin in 1959, and by Wayne C. Harris, west of Turtleford, a nest with eggs (year not known).

I wish to thank Alan R. Smith for providing detailed information from which he made his maps for the *Atlas of Saskatchewan Birds*, and for details on the Breeding Bird Surveys. Stuart Houston helped me prepare this note.

*(Editors note: the bird was clearly identifiable in three accompanying slides. These were not suitable to publish)*



Maximum butterfly longevity: Cabbage Butterfly: 3 days for female/ 17 for male;  
Tiger Swallowtail, 3/12; Spring azure, 4/2; Orange Sulphur, 14/25;  
Viceroy, -/17; Great Spangled Fritillary, -/22;  
Paul Opler and George Krizek,  
*Butterflies East Of The Great Plains.*



# NEW BIRD RECORDS FOR THE MCLENNAN LAKE AREA, SASKATCHEWAN

DIANA BIZECKI ROBSON, 811 Avenue E North, Saskatoon, SK S7L 1S7

Northern Saskatchewan is the most under-explored area of the province. The lack of exploration is evident when studying the Atlas of Saskatchewan Birds.<sup>1</sup> While bird records are quite extensive in southern areas, northern parts of the province contain many record gaps. In general, if a map sheet has fewer than 40 species recorded for it, the area is likely under-explored not ornithologically impoverished.

In June of 1998 I was able to explore the McLennan Lake area. The Atlas indicated that only 47 species of birds had been seen in the map sheet containing McLennan Lake (73 P- 16). However, I documented sightings of seven new bird species for the map sheet during my brief visit: Ruffed Grouse, Downy Woodpecker, Eastern Phoebe, Hermit Thrush, Cedar Waxwing, Philadelphia Vireo and White-throated Vireo. Most of the birds were exhibiting breeding behavior when they were seen (i.e. singing, nest building, catching food, etc.).

Rick Kolstad and Debbie Peters, long-time residents of the area and amateur naturalists, were interviewed regarding their bird sightings over the last few decades. They have seen 95 species of birds in map sheet 73 P- 16. Thus, 41 of the bird species that they observed in the area had not been verified for the map sheet or seen by myself. The 41 new species for the map sheet were: Great Blue Heron, Tundra Swan, Snow Goose, Brant, Green-winged Teal, Bufflehead, Common Merganser, Northern Harrier,

Northern Goshawk, Golden Eagle, Merlin, Willow Ptarmigan, Sandhill Crane, Least Sandpiper, Franklin's Gull, Common Tern, Great Horned Owl, Great Gray Owl, Northern Saw-whet Owl, Ruby-throated Hummingbird, Rufous Hummingbird, Pileated Woodpecker, Horned Lark, American Crow, Red-breasted Nuthatch, Mountain Bluebird, American Robin, Varied Thrush, European Starling, Red-eyed Vireo, Black-and-white Warbler, Rose-breasted Grosbeak, Savannah Sparrow, Lincoln's Sparrow, White-crowned Sparrow, Red-winged Blackbird, Rusty Blackbird, Common Grackle, Pine Grosbeak, Hoary Redpoll and Evening Grosbeak. Data regarding these new sightings were sent to Al Smith for incorporation into the Saskatchewan bird database for the province. Looking at surrounding map sheets it is possible that an additional 82 bird species may occur in map sheet 73P- 16.

Given the lack of records for northern Saskatchewan and the need for data in these areas, I encourage all avid birders to visit those map sheets that have few bird records. New species for map sheets should be carefully documented and sent to Al Smith with the Canadian Wildlife Service.

## Acknowledgements

Thanks are extended to Rick Kolstad and Debbie Peters of Forest House Lodge, who acted as tour guides and hosts during my visit to the area.



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# HOW WE HELPED A RED-BREASTED NUTHATCH

EDNA SPROULE, 1338 Colony Street, Saskatoon, SK S7N 0S7

In April 1998, we were relaxing in our backyard, soaking up the sun, when we heard a persistent tapping sound. Upon investigating further, we realized that the noise was coming from a Red-breasted Nuthatch, pecking away at a knot in our neighbour's apple tree trunk. It was trying to enlarge the hole, exactly 2 m above the ground, and kept at it for more than two weeks. The knot was so hard that the bird could make very little progress.

Finally, my husband, Jack, took pity on the nuthatch and lent a helping hand. He successfully drilled out the knot hole. The pair then had an adequate cavity, at least 10 cm deep, and took up residency. We watched the male as he brought sunflower seeds from our three

hanging backyard feeders to his mate in the nest hole. We were away from 25 April to 3 May and suspect the young fledged during that time.

Our neighbors, on the other side, have a cavity in another ornamental crabapple tree, occupied by Black-capped Chickadees in 1998. That hole is less than 1 m above ground. The chickadees and their resulting brood were also constant visitors at our feeders.

Now it is April 1999. A pair of nuthatches, presumably the same pair, after eating at our feeders all winter, are visiting the nest site again. We are happy to have them nesting so close by for a second year, and proud that we were able to make this possible.



Come forth into the light of things. Let nature be your teacher.  
William Wordsworth.



# EXTENSION OF RANGE OF VIOLET-GREEN SWALLOW

C. STUART HOUSTON, 863 University Drive, Saskatoon, SK S7N 0J8

Three times in recent years, in 1992, 1996 and 1998, I have had the unexpected pleasure of finding groups of Violet-green Swallows flying around "badlands" cliff faces on the north side of the South Saskatchewan River. These pretty little swallows resemble Tree Swallows apart from the white patch completely across the rump.

Because my visits were a week or two before the optimum time for adults feeding young, because I could spare only twenty minutes of careful observation before returning to Prairie Falcon banding nearby, and especially because during incubation their nests in tiny crevices in dirt cliff faces are difficult to find, we failed each year to obtain proof of nesting. I am reasonably confident that their behaviour was that of swallows on territory; if so, this represents an extension of their breeding range north and east from the badlands near Val Marie.

On 7 June 1992, David Miller and I identified two pairs of Violet-green Swallows exhibiting territorial behaviour near the Prairie Falcon "Lookout Eyrie" which looks down on the Bill Friesen ranch in the river valley, south west of Eston, and 70 km east of the Alberta boundary. The next two falcon sites, 1.5 and 3.0 km east of the ranch buildings, also had two and four pairs, respectively.<sup>4</sup>

No Violet-greens were seen during the next three years, but on 15 June 1996, there were four pairs of these swallows at one of the 1992 sites in Powerline coulee, 1.5 km east of the Friesen ranch buildings. Again, on 14 June 1998, Bruce

Hanbidge, Paul Gully and I counted at least twelve swallows in the first coulee west of the west road down to the Lancer Ferry, about 6 km east of the Friesen buildings. Knowing of the predilection of Western Kingbirds to build nests in the same tree or the tree adjacent to active Ferruginous Hawk nests, and of Cliff Swallows to build their mud-bottle nests in close proximity to active Prairie Falcon holes (Mike Gollop, pers. comm.), one cannot help but speculate that the Violet-green Swallows may possibly have been be doing the same, seeking security from other predators under the protection of the falcons.

Although the traditional Rocky Mountain nests of the Violet-green Swallow have been in inaccessible sites such as abandoned woodpecker holes in tall tree snags, during this century this swallow has learned to use nest boxes along the Pacific coast. East of the mountains in extreme southern Alberta, Violet-greens were reported by Salt and Salt<sup>6</sup> to nest in fair numbers along the Milk River and Belly River, but not, at that time, the South Saskatchewan River. Evidence for breeding along the latter river at Medicine Hat, and downstream from there, came only with publication of *The Atlas of Breeding Birds of Alberta* in 1992.<sup>7</sup> All of these areas in Alberta are in rough terrain known as "badlands," offering cliff faces as nest sites (where they are sometimes associated with Mountain Bluebirds and Rock Wrens).

The Violet-green Swallow has been increasing in numbers and extending its



range in Alberta,<sup>7</sup> and for at least thirty years this process has extended into Saskatchewan.

The first evidence of Saskatchewan breeding came at the summer meet of the Saskatchewan Natural History Society at Val Marie on 14 June 1969, when I had an opportunity to find and photograph the first Saskatchewan nest of the Violet-green Swallow. Once we identified the swallows, and suspected that nesting was a possibility, Arnold Nijssen, David Riome, Donald Houston and Keith Hobson, the latter two part of the Saskatoon junior contingent, assisted me in scanning the clay cliff face. The one nest we found was lined with fresh feathers, but no egg had yet been laid.<sup>3</sup>

The second Saskatchewan nest record was in similar "badlands" habitat, but much farther east, in Goose Creek valley south of Constance, Saskatchewan. Here Gary Anweiler found suitable nest holes with droppings in a steep clay cliff, on 12 July 1975.<sup>2</sup>

On 19 July 1977, Margaret Belcher found a pair flying in and out behind a sandstone outcropping, locally known as "Jones' Peak," the easternmost part of Ravenscrag Butte, on the north bank of the Frenchman River valley, eight miles west of Eastend. Wayne Harris found them at the same site in July that year.<sup>1,8</sup> Michael Gollop (pers. comm.) has seen pairs there each year since 1975.

Unequivocal proof of production of young was provided by Bob Luterbach, who found at least four adults feeding young near Eastend, 7 July 1996. Evidence that their numbers continued to increase in Alberta was gained 15-19 June 1997 during a river trip by Bob Kreba, who found them common along the South Saskatchewan River, with over 200 found between Medicine Hat, Alberta and Estuary, Saskatchewan (13

km inside the western boundary of Saskatchewan).<sup>5</sup> In 1998, Rob Wapple (pers. comm.) found a pair along the cliffs of the North Saskatchewan River north of Leader.

Not only has this swallow increased in numbers and in range in Alberta, it now occupies some of the "badland" territory in Saskatchewan. If its numbers and range continue to increase, it should be watched for everywhere that clay cliffs and rough "badlands" are present.

## Acknowledgements

I wish to thank Michael Gollop, Bob Kreba and Rob Wapple for unpublished information.

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# A SWIMMING SQUIRREL

PENNY DAVIS, Group Site 317, Box 2, Rural Route #3, Saskatoon, SK

Late last June my husband and I were canoeing at the north end of Makwa Lake. There was a moderate wind and small waves on the surface. As we paddled, from time to time, we could see a small dark head in the water that we assumed belonged to a Muskrat. However when we went to look more closely we realized that it was a Red Squirrel dog paddling strongly out into the lake. By that time it was about 50 metres offshore. We managed to turn the animal back towards shore by

paddling around it, and we eventually saw it climb out onto the bank, shake itself and disappear into the bush.

Close to the site where we first saw it swimming there was an old tree leaning out over the water. We guessed that it had fallen onto the lake and, because of the choppy surface, had been unable to decide which way to swim. Have any other readers witnessed an aquatic squirrel?



# WINTERING SAVANNAH SPARROW IN SASKATOON

VI COUTU, 1713 Sommerfeld Ave., Saskatoon, SK S7H 2S7

In November, 1991, after the last of the juncos left our backyard feeder for points south, a lone immature White-throated Sparrow remained. We observed him taking shelter from the heavily snowbound yard under one of two overturned canoes stored there. He did not permit the House Sparrows to eat from the feeder when he was there.

On November 29 he was joined by a Savannah Sparrow which he did not permit to eat beside him, but did allow on the feeder. As the temperature dropped well below zero we noticed that the Savannah occupied the other canoe. The feeder was located just outside our patio doors and several members of the

Saskatoon Natural History Society observed both birds from inside our house.

In no time both sparrows were occupying the same canoe, and eating together on the feeder. The White-throated Sparrow was more aggressive; activity inside our house did not affect him, whereas the Savannah left the feeder when there was movement indoors. The Savannah would fly to the nearby Lodgepole pine and perch for long periods of time.

On January 5 1992, perhaps frightened by the holiday crowds milling around inside and outside our house, the Savannah Sparrow disappeared. The White-throated Sparrow remained until Spring.



# CLEVER MAGPIES OPEN PIZZA BOX

Photo story by Richard Marjan, Saskatoon Star-Phoenix, 204 Fifth Ave., North, Saskatoon, SK S7K 2P1

Late in February, while driving along Saskatchewan Crescent East, near the corner of 15<sup>th</sup> Street, overlooking the South Saskatchewan River, I noticed three Black-billed Magpies attacking a supposedly empty pizza box. One of them carried a band that I later learned had been placed on its leg in Stuart and Mary Houston's yard, less than two city blocks distant.

It seemed to me that the magpies were curious as to whether there was any food left in the box. I watched for about fifteen minutes, taking

photographs at appropriate moments, as the magpies took turns trying to open the box. Each used its beak as a tool — with persistence and eventual success.

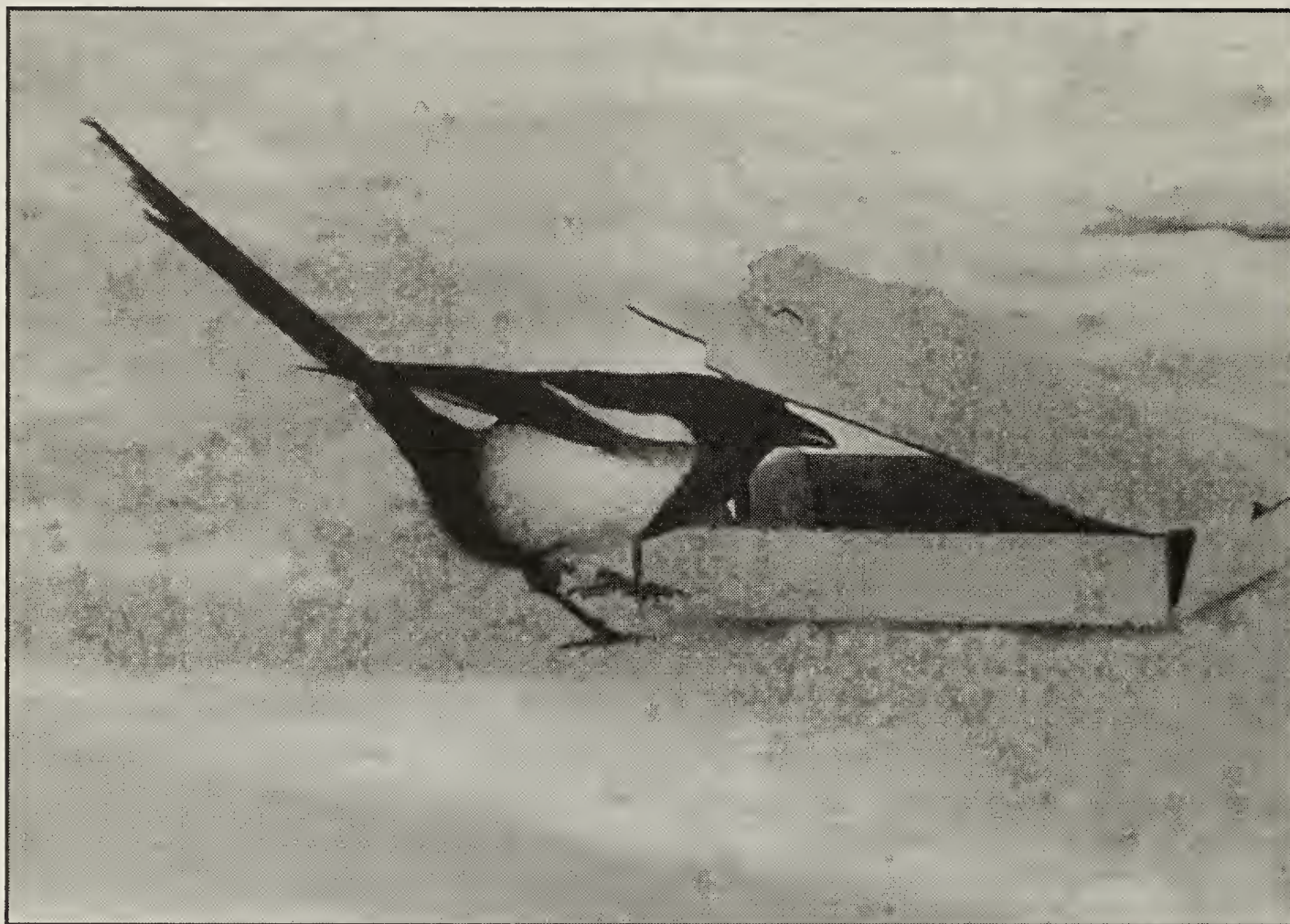
The photos corroborate what Candace Savage tells in her book, *Bird Brains*: namely that corvids are among the smartest of all birds.

(Editor's note: These photos were in the centre of the front page of the *Saskatoon Star-Phoenix* on Thursday, 25 February 1999, and are reproduced by courtesy of the Star-Phoenix.)

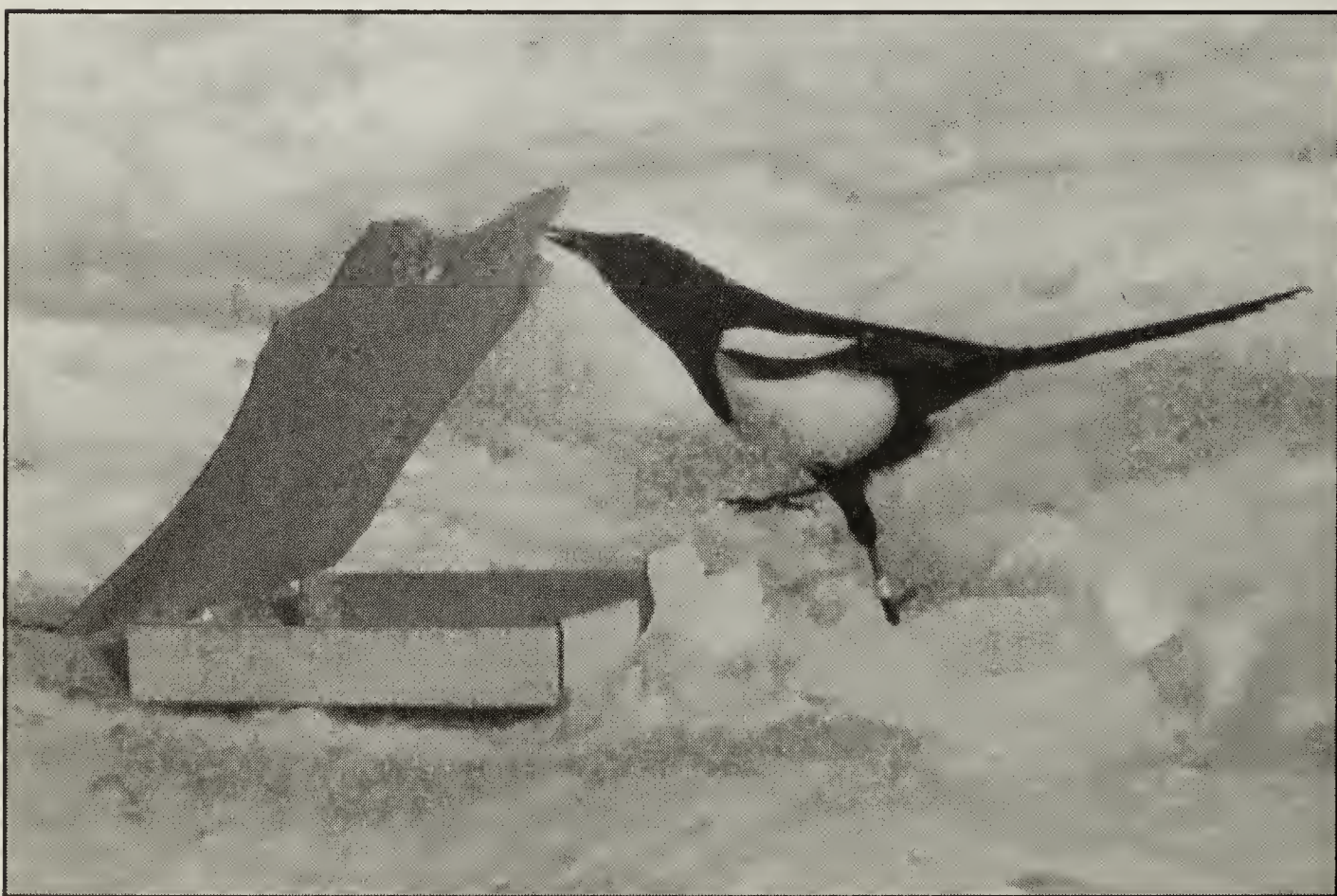


**Figure 1 - Banded magpie lifts up corner of box with beak to see what is inside.**





*Figure 2 - Banded magpie ducks under cover for better look.*

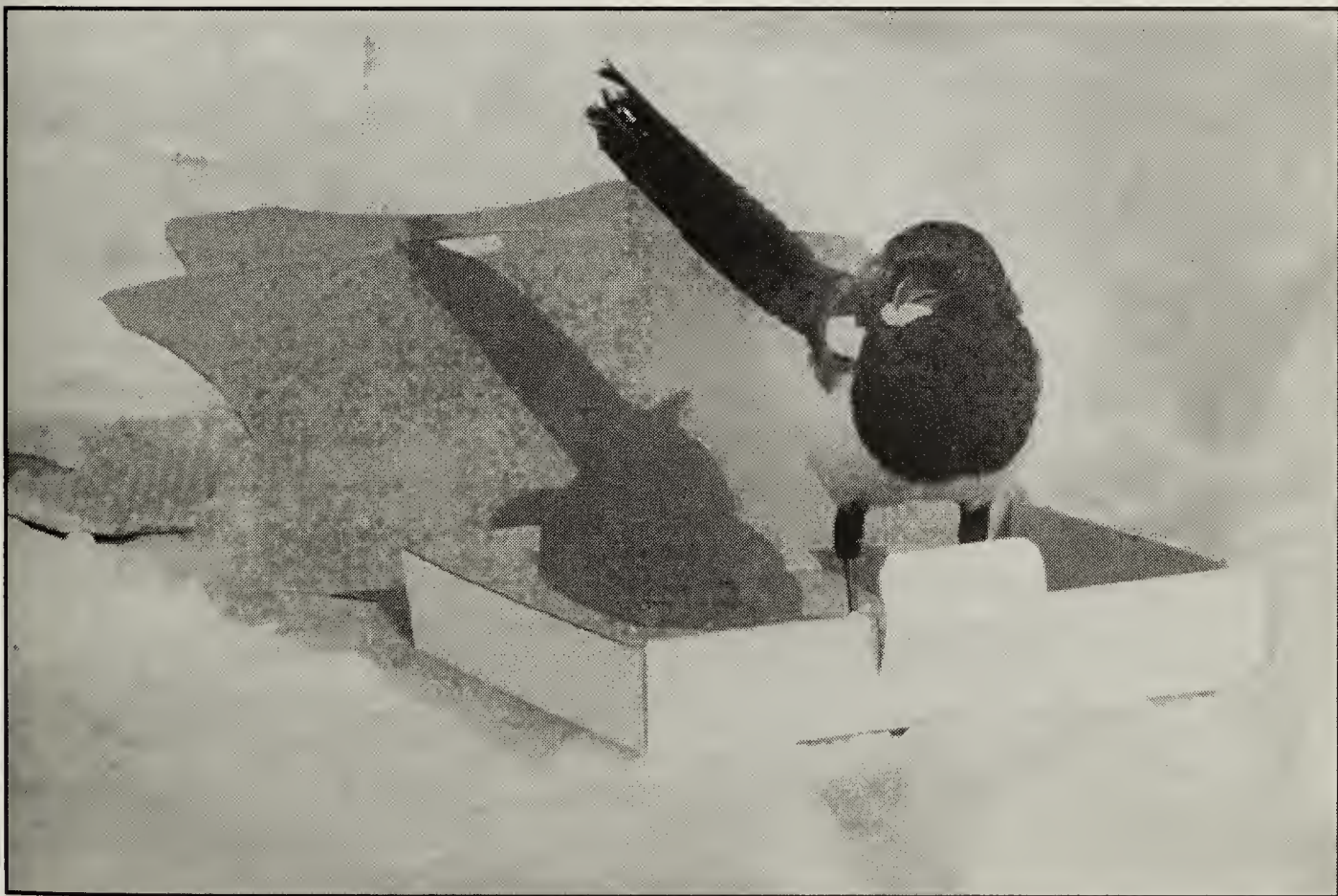


*Figure 3 - Banded magpie pushes box top higher.*





***Figure 4 - Unbanded magpie takes his turn.***



***Figure 5 - Success! Box is open. There are some crumbs in the box; at this point the banded magpie holds a piece of green pepper in its mouth.***



# A SHORT-TAILED SHREW — COMMON GRACKLE ENCOUNTER

ROBERT W. NERO and RUTH F. NERO 546 Coventry Road, Winnipeg, MB  
R3R 1B6

We have become accustomed to seeing Short-tailed Shrews (*Blarina brevicauda*) coming out to forage for sunflower and other seeds on the ground in our well-wooded urban yard. Their excursions onto the lawn in full sunlight, however, seem reckless, especially given the frequent occurrence at the same time of Red Squirrels (*Tamiasciurus hudsonicus*) and Blue Jays (*Cyanocitta cristata*), species known to prey on small mammals.<sup>3, 4</sup> Less vulnerable, we assumed, was a shrew that often came out from its lair in rocks beside our ground-level birdbath for a drink, for it was never far from cover. This creature, or one of its kind, inspired a recently published poem.<sup>2</sup> The birdbath is readily visible from our living room window.

Common Grackles usually appear in our yard in numbers in late July and August, coming to drink and bathe in the birdbath, and to feed on cracked corn and acorns, and sometimes to *ant*!<sup>1</sup> About 30 grackles, apparently all adult males, were present on 10 August 1998, a bright, hot day, reaching 31°C. One of us (RFN) was fortunate enough to see a grackle in the birdbath struggling with a shrew. Hopping about with the shrew in its bill, wings flapping in the water, the grackle lost its prey, grabbed the shrew again, then lost its grip a second time, whereupon the shrew escaped, darting into a crevice in the adjacent rocks. The grackle then flew off to join the rest of the flock nearby on the lawn.

Presumably, the grackle and the shrew had met by chance at the edge of the birdbath. These were well-fed grackles; a hungrier bird might well have managed to subdue the shrew, as was reported by an observer in Kentucky who chanced upon a grackle attempting to predate a Short-tailed Shrew.<sup>5</sup> That shrew apparently survived owing only to the intervention of the observer.

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# FIFTY YEARS AGO - Excerpts from Blue Jay Volume 7, No. 2, June 1949

Selected by Mary I. Houston

This was the second issue edited by Lloyd T. Carmichael and published by the newly- formed Saskatchewan Natural History Society. Mrs. Isabel M. Priestly had founded the Blue Jay and edited it from September 1942 until her sudden and unexpected death on 23 April 1946. Cliff Shaw carried on as editor for three years, but the undertaking proved too great for the Yorkton Society alone.

Executive members of the new provincial society were: Honorary President, Dr. W.P. Thompson, University of Saskatchewan; President, Dr. G.F. Ledingham, Biology Professor, Regina College; 1<sup>st</sup> Vice-Pres., Cliff Shaw, Yorkton; 2<sup>nd</sup> Vice-Pres, Maurice G. Street, Nipawin; Secretary-treasurer, W.F. Whitehead, Regina. Directors were H.C. Andrews, Moose Jaw; Fred Bard, Regina; Dick Bird, Regina; E.W. Brooman, Prince Albert; A.W. Brownlee, Regina; A.C. Budd, Swift Current; Stuart Houston, Yorkton and Winnipeg; L.T. McKim, Melfort; Lloyd Peterson, Indian Head; R.J. Priestly, Regina; F.W. Robinson, Regina; E.W. Van Blaricom, Tisdale.

## **Cliff Shaw, Yorkton:**

"Ten Cedar Waxwings were seen April 11 on a crabapple tree. ... These are, no doubt, the same group of birds that have been around during the winter. Five ... were observed at the time of the Christmas count. During January ... ten ... in the downtown section. ... Normally the average spring arrival ... is June 1."

"A lone Purple Martin was seen inspecting one of the bird houses at the

city hall, April 23. This was one day earlier than any previous record here. The species arrived in full force five days later, April 28. The average date has been May 4."

"A Brown Creeper was seen inspecting the bark of an elm tree on a Yorkton street, April 26. ... two days earlier than other years."

"Heaviest migration of hawks ... ever noticed ... Yorkton, April 10 ... Twenty-five Buteos were seen between 9.30 and 10.30 a.m., all except five were observed during the first half hour ... with the exception of one Rough-leg, all appeared to be Red-tails. ... in ones and twos."

## **Wilkie district:**

"It is most unfortunate than another Whooping Crane has been wantonly destroyed. Early in May the body of one was found in the Wilkie district, and it is thought that it was shot last fall ... This is the rarest of North American birds. ... Careful counts have been made of the number left. Last winter there were only 33."

## **K.E. Baines, southwest of Saltcoats:**

We also had a dancing ground of the Pinnated Grouse [Greater Prairie-Chicken] five miles west of Saltcoats, on either side of the road, as well as right on it. These birds are much more showy when courting, but they are very scarce there and I have never seen one at Tisdale."



### **A.McPherson, Saskatoon:**

"Trapping birds this spring for banding was poor; they did not seem to care for food in the traps, so for a change I started using more water in them and got better results. ... This year I have banded more thrushes than I have done before and the trap I catch them in is just one for water. I had an unusual bird around my place this spring — Townsend's Solitaire. It stayed around my bird traps from April 10 to April 13. ... It was not the least bit afraid of people. We got quite close to it and didn't need our field glasses to identify its field marks. It stayed around my bird trap all day. ... On seeing one, it would fly down, catch the insect, then back to the same perch again. ... I even tried putting trout flies in my traps, suspended from the top, but with no luck."

### **Harold Kvinge, Hawarden:**

"I have observed three Western Grebes on our pond, May 3. The Long-billed Curlews seem to be more numerous this spring. ... A pair of Avocets, also a pair of Burrowing Owls are nesting near the pond. The McCown's Longspurs are quite numerous around here, although they are rare in many parts of Saskatchewan. Red-winged Blackbirds have not been so numerous in our trees for many years. They sing almost continually."

### **Flora of the Farming and Ranching Areas of the Canadian Prairies**

"Arch C. Budd ... has finished compiling a book describing in detail the flowering wild plants of the prairies, extending from the prairies to the foothills of the Rockies. ... written primarily for the Saskatchewan agricultural-representative service ... about 200 copies have been printed."

### **Blue jay subscriptions as prizes:**

"Charles Leech, chief supervisor of the Youth Centre, Regina, is to be highly congratulated on the enthusiasm which he and his staff have aroused among their classes in connection with wild plant and animal life and their conservation. ... for two weeks or more the boys and girls were busy visiting the museum and obtaining information from various sources... a contest consisting of a quiz and dealing with purposes of National Wildlife Week, with wild plants, with birds and with other animals, was announced. ... The quiz was held April 19, over 100 contestants participating. For prizes, seven yearly subscriptions of the *Blue Jay*, two copies of Taverner's *Birds of Canada*, fourteen copies of Taverner's *Bird Houses and their occupants*, and fourteen copies of *Game and Fur in Saskatchewan*, were awarded."



The dandelion tells me when to look for the swallow, the dogtooth violet  
when to expect the wood thrush, and when I have found the wakerobin  
in bloom I know the season is fairly inaugurated.

John Burroughs.



## NATURE IN IRELAND

A scientific and cultural history. Edited by Joan Wilson Foster (1997). Dufour Editions Inc. Chester Springs. PA 19425-0007. Paper \$39.95. 658 pages.

This substantial fine printed book is a very interesting social history of nature studies in Ireland, principally over the last four hundred years. One thing immediately obvious is that this book is a study of natural history as seen through Anglo-Irish eyes, rather than through Gaelic-Irish eyes, as the vast majority of the chapters, authors and names mentioned in the text are non Gaelic-Irish family names. This is due to a number of social factors including the fact that until recent times the native Irish had not the time, education nor the money to pursue leisure activities such as the study of the many branches of natural history. The dominant catholic church's ambivalent attitude toward the study of nature also did not help (Pages 427-436).

The book is written in a manner that the educated layman can readily understand. It is divided into twenty-six chapters each written by specialists in the subject under discussion. The chapters cover such diverse subjects as geology, meteorology, botany, physical geography, entomology, mammalogy, ornithology, fisheries, major ecological surveys, Irish naturalists abroad, enlightenment and education, Darwin in Belfast, nature and Irish nationalism, the issue of names (Irish names of birds, plants etc), the history of Natural History, the art of nature illustration, field sports (hunting, shooting, fishing), the natural history of demesnes (large estates), attitudes to nature in Ireland, and the culture of nature.

The book should have wide readership as it combines a very detailed account of natural history together with the attitudes of the various ethnic groups living in Ireland towards their surroundings, and what they perceive other groups in society are doing to improve them, limit access to them, leave the habitat as is, or destroy the habitat as the majority group sees it.

Most of the material in this book should be of interest to Canadian naturalists as they could make comparisons with Canadian physical and social conditions. Anecdotal evidence suggests that there are considerable differences in attitudes to the natural environment among French-Canadians, English-Canadians, southern aboriginal nations, and Arctic aboriginal groups. What group has published the earliest and most papers on natural history? What are their attitudes to the natural environment, appreciation or consumption? What is the place of nature in the culture and art of these peoples? The book explains what happened in Ireland, and gives stimulating guidelines on subjects to cover for comparison purposes. It is a useful addition to personal, school and university libraries.

Reviewed by Stewart Holohan, 150 Woodland Drive, Midland, ON L4R 4S6



# WILD BIRDS ACROSS THE PRAIRIES

WAYNE LYNCH. 1999. 138 pp. Fifth House Ltd., Calgary, AB 138 pp., illus., index. Soft cover, \$24.95.

A physician, practising in Regina at the time, Wayne Lynch decided in 1979 to switch careers. Having fallen in love with the native prairie grasslands, he was determined to document their beauty, variety, and fragility in the face of human encroachment. He fondly remembers his early association with Fred Lahrman, Lorne Scott and Gary Seib, local photographer-naturalists whose infectious interest in the outdoors, birds in particular, no doubt influenced his decision to become a nature photographer full-time.

Remembering the thrill I felt when I laid eyes on *Married to the Wind*, Wayne Lynch's first book about prairie grasslands (1983), I felt the same keen anticipation when I learned that he had just produced a new book on prairie birds. *Wild Birds Across the Prairies* is a handsome volume, 138 pages in 8½ x 11 format, lavishly illustrated with color photos. Following a brief introduction, a map, and four illustrations of varied prairie habitat, Lynch uses an approach similar to that used in most field guides. He documents 85 species, most of them associated with the prairies, providing information on bird families, field identification, habitat, wintering grounds, feeding habits and breeding biology. The well-written accounts, each accompanied by one or two stunning photographs, are somewhat fuller than those in an ordinary field guide, often providing information that the lay reader might not learn elsewhere. He tells us, for instance, that the Franklin's Gull's 14,000-kilometre round-trip to Peru and northern Chile is one of the longest trips made by any gull. That in hot weather, incubating avocets (male and female)

soak their belly feathers in water before sitting on the nest, thus cooling the eggs and keeping nest humidity high. That to cool themselves in desert heat, Turkey Vultures urinate on their legs, the evaporation of the "watery whitewash" actually lowering the birds' body temperature. We learn, too, that in winter chickadees "chill out" at night, their body temperatures dropping 10° to 12° C, yielding an energy saving of up to 23 per cent. The reader will soon look for these bits of bird lore, noting, in particular, a section in some accounts which the author labels "Trivia tidbit."

Looking through the book, it soon becomes apparent that Lynch is most attracted to prairie coulees and sloughs and their inhabitants. He gives substantial treatment to grebes; ducks (you'll enjoy his "bottoms-up" photo of three Northern Pintail drakes dabbling for food); raptors (the photo of Golden Eagle chicks looks suspiciously like it might have been taken in the South Saskatchewan River valley); shorebirds (the cover photo is of an American Avocet reflected in sky-blue water); gulls; terns; and owls (including delightful family shots of the fast disappearing Burrowing Owl); swallows and blackbirds.

I have one serious reservation about Lynch's book. The author should have given more consideration to truly representative grassland species, and to their vanishing environment. Despite the claim on the back cover that this is "much more than a bird guide," the potential purchaser should know that it is "something less than a bird guide" when it comes to prairie birds away from



trees and water. He does include Sharp-tailed and Sage grouse, Upland Sandpiper, Long-billed Curlew, Burrowing and Snowy owls, Horned Lark and Western Meadowlark, but that's the end of the list. He omits the longspurs, Lark Buntings, pipits and sparrows, which together form the bulk of true grassland species. [The only sparrow included is the House Sparrow, an alien, unrelated to North American sparrows.] I looked in vain for Vesper, Savannah, Clay-coloured, Baird's, Le Conte's, or Sharp-tailed sparrows; Sprague's Pipits; Lark Buntings; McCown's or Chestnut-collared longspurs, and common to abundant migrants like the American Pipit, Snow Bunting and Lapland Longspur. Any book dealing with prairie grassland birds should include most of these species, perhaps

at the expense of peripherals which he does include, like the Blue Jay, Belted Kingfisher, Evening Grosbeak and Pine Grosbeak. Given Lynch's photographic skill and experience, a few more weeks in southern Saskatchewan or Alberta would have provided him with the photos needed to balance his collection of prairie bird portraits and enhance the value of this beautiful book.

Very reasonably priced, *Wild Birds Across the Prairie* will make an ideal gift for friends and family members interested in birds, wildlife photography, or the continent's prairie grassland region.

Reviewed by J. Frank Roy, 650 Costigan Way, Saskatoon, SK S7J 3R2



The world's largest wind-generated power project is in southern California. Over a 2-year period 13 sq. mi. of the 80-sq-mi. facility were surveyed for dead birds. Of the 182 carcasses found, 119 were raptors, including 16 Golden Eagles. Suggestions for reducing mortality include painting the windmill blades to make them more visible, installing noisemakers and eliminating small mammals. The last would require massive poisoning and habitat destruction. Since each energy source has some detriment to the environment, all of us should pay greater attention to energy conservation.



Errata

In "Clutch Sizes In Manitoba Common Snapping Turtles" by Dean J. Berezanski (Blue Jay 57:50-55) the references for the sentence on page 51

ending "...relating egg size to female size." should be references 8 and 12, not 8 and 11. And Table 2. (Examples Of Common Snapping Turtle Clutch Sizes.) should be replaced by the following:

Table 1: Examples of common snapping turtle clutch sizes.

Mean $\pm$ sd (or se; n)	Locale
65.1 $\pm$ 13.8 (n=8)	Manitoba (this paper; includes one clutch from NW Ontario)
47.4 $\pm$ 11.3 (n=26)	Valentine NWR, Nebraska (from raw data in Finkler 1998)
46.8 $\pm$ 11.3 (n=77)	Crescent Lake NWR, Nebraska (Iverson et al 1997)
41.5 $\pm$ 12.86 (n=18)	Cootes Paradise, Lake Ontario, Ontario (Brown et al 1994)
37 $\pm$ 11 (n=255)	New York state and Wisconsin (Yntema 1970)
33.9 $\pm$ 10.03 ( $\pm$ se; n=46)	Algonquin Park, Ontario (Loncke and Obbard 1977)
33.0 $\pm$ 8.39 (n=18)	Algonquin Park, Ontario (Brown et al 1994)
30.9 $\pm$ 10.87 (n=16)	New York state (Petokas and Alexander 1980)
27.9 $\pm$ 0.76 ( $\pm$ se; n=68)	Southeast Michigan (Congdon et al 1987)
23.6 $\pm$ 6.6 ( $\pm$ se, n=4)	North Carolina (Congdon and Gibbons 1985)

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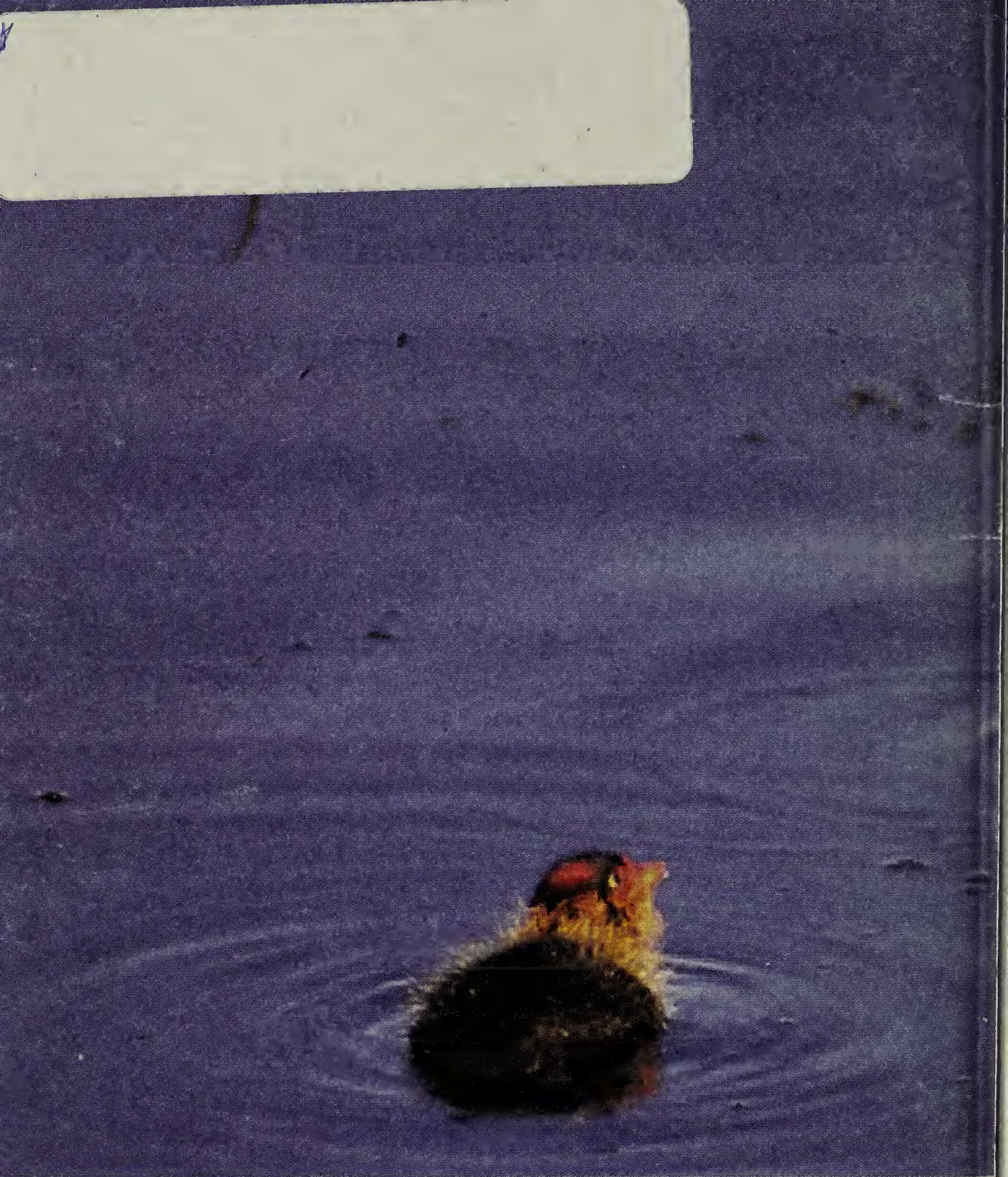
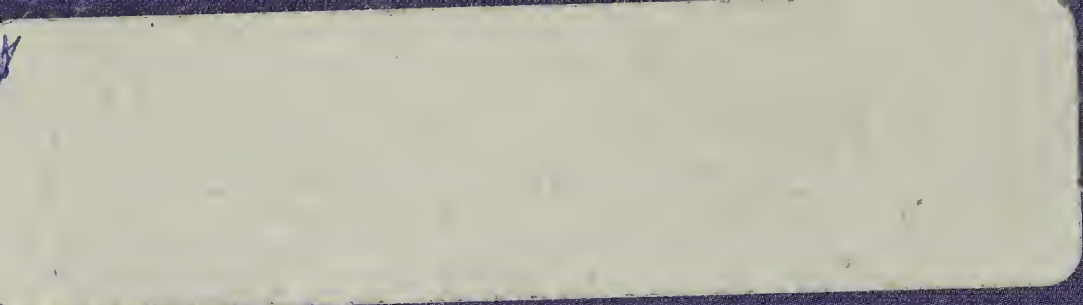
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